

Peter Parker

Environmental Consultants Pty
Ltd

Broken Head Road, Broken Head,
NSW, 2481

☎ Phone/fax 0266 853 148



ACN 076 885 704

A Flora and Fauna Survey of 355 Cudgen Road Cudgen and an Associated Pipeline Route

**Prepared for
Australian Bay Lobster Producers in
Association with David McPhee and
Associates**

September 2004

CONTENTS

	GLOSSARY	3
1.0	INTRODUCTION	7
2.0	PREVIOUS STUDIES	7
3.0	FIELD SURVEYS	8
3.1	Vegetation	9
	3.1.1 Air photo interpretation and field surveys	9
	3.1.2 Vegetation classification, structure and floristics	9
3.3	Fauna	10
	3.3.1 Aims	10
4.0	RESULTS	11
4.1	Vegetation associations	11
	4.1.1 Woodland	12
	4.1.2 Grassland	12
	4.1.3 Plants of conservation significance	13
4.2	Fauna	15
	4.2.1 Reptiles	16
	4.2.2 Frogs	16
	4.2.3 Birds	16
	4.2.4 Mammals	17
5.0	DISCUSSION	18
5.1	Threatened fauna	18
5.2	Environmental management	18
6.0	STATUTORY CONSIDERATIONS	18
6.1	Section 5A, conclusion	35
6.2	<i>Environmental Protection and Biodiversity Conservation Act, 1999</i>	36
	6.2.1 Determining whether an action is likely to have a significant impact	37
	6.2.2 Exceptions	38
	6.2.3 Conclusion	39
7.0	REFERENCES	39

GLOSSARY

Abundance: means a quantification of the population of the species or community.

Affected species: mean subject species likely to be affected by the proposal.

Conservation status: is regarded as the degree of representation of a species or community in formal conservation reserves.

Critical habitat: The area declared to be critical habitat under Part 3 of the TSC Act.

Development: in relation to land, means: the erection of a building on that land, the carrying out of work in, on, over or under that land, the use of that land or of a building or work on that land, and the subdivision of that land.

DEC: Department of Environment and Conservation

Ecological community: An assemblage of species occupying a particular area.

Endangered ecological community: An ecological community specified in Part 1 of Schedule 1 of the *Threatened Species Conservation Act 1995*.

Endangered population: A population specified under Part 1 of Schedule 1 of the *Threatened Species Conservation Act 1995*.

Endangered species: A species listed under Schedule 1 of the *Threatened Species Conservation Act 1995*.

EPA Act: *Environmental Planning and Assessment Act, 1979*

Habitat: An area or areas occupied, or periodically or occasionally occupied by a species, population or ecological community and includes any abiotic component.

Locality: The area within a 5 km radius of the study area.

NPW Act: *National Parks and Wildlife Act 1974*.

GLOSSARY

Recovery and threat abatement plan: A plan to promote the recovery of threatened species, population or an ecological community with the aim of returning the species, population, or ecological community to a position of viability in nature. The purpose of the threat abatement plan is to manage key threatening processes with a view to their abatement, amelioration or elimination.

ROTAP: Rare or threatened Australian plant.

SEPP: State Environmental and Planning Policy.

Significant species: means species not listed under the *Threatened Species Conservation Act 1995* but considered to be of regional or local significance.

Study area: is the subject site and any additional areas which are likely to be affected by the proposal, either directly or indirectly.

Subject site: The area which is proposed for development or activity.

Subject species: Those threatened species which are considered known or likely to occur in the study area.

Threatened species: A species specified in Part 1 or 4 of Schedule 1 or in Schedule 2 of the *Threatened Species Conservation Act 1995*

Threatening process: means a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities. This definition is not limited to key threatening processes.

TSC Act: *Threatened Species Conservation Act 1995*

Vulnerable species: A species listed under Schedule 2 of the *Threatened Species Conservation Act 1995*

SUMMARY

- This flora and fauna survey was prepared for Australian Bay Lobster Producers and David McPhee and Associates, Consulting Engineers. It forms part of a development application for an aquaculture proposal to be located at 355 Cudgen Road, Cudgen.
- The site is currently used for the cultivation of sugar cane and grazing.
- A pipeline will transport seawater to the site. The pipeline will extend from the South Pacific Ocean at Kingscliff proximal to the Police Station, along a Public/Crown reserve via Marine Parade, Beach Street, Elrond Drive, Chinderah Road, Crescent Street and westward to the site along a proposed new road. A separate pipeline will transport wastewater to the Tweed sewage treatment plant.
- The site exhibited little biological diversity. Vegetation was dominated by sugar cane and environmental weeds. Dominant weeds included blue billygoat weed and canary seed grass. Roadside verges along the pipeline route were also dominated by weeds with few native species being recorded.
- No threatened plant species was recorded or is expected to occur and it is unlikely that threatened fauna species would frequent the site due to the depauperate nature of the existing habitat.
- In terms of the statutory assessment, this study concluded that:
 1. No viable populations of threatened species were likely to be placed at risk of extinction by the proposal;
 2. The viability of endangered populations will not be significantly compromised;
 3. No regionally significant area of known habitat will be removed;
 4. No known habitat for threatened species will become isolated;
 5. No critical habitat will be affected;
 6. The proposed development is not a key threatening process and threatening processes are not likely to increase; and
 7. Threatened fauna which may seasonally or opportunistically occur at the site are not at the extreme of their known geographical range.



Pipeline route



Peter Parker

Project: Aquaculture

Client: Australian Bay Lobster Producers

Fig. 1: The site and the proposal



Source: Australian Bay Lobster Producers Date: September 2004 Scale m 0 ————— 500

1.0 INTRODUCTION

This flora and fauna survey was prepared for Australian Bay Lobster Producers and David McPhee and Associates. It accompanies a development application for the construction of an aquaculture facility for the production of the Bay Lobster (*Thenus spp.*) known locally as the Moreton Bay Bug. The facility will be based on recirculation aquaculture technology inside horticultural structures with the Bay Lobsters being housed in raceways.

The proposed project site is described as lots 706, 708, 709, 710 DP 1000580; lot 1 DP267742; and lot 1 DP578962, Parish of Cudgen, 355 Cudgen Road, Cudgen, NSW. The site has a total area of approximately 148.5ha, of which 45ha is proposed to be filled and bunded to provide protection from the 1 in 100 year flood event.

The land has an 810 m frontage along the western side of the new Pacific Highway and is accessed by an entrance off the north-western corner of the Murwillumbah overpass.

2.0 PREVIOUS STUDIES

There are a number of previous studies that relate to flora and fauna assemblages in the general area of the proposal. These include:

- Ecograph 1999 *Tweed Vegetation Management Plan*. A draft report to Tweed Shire Council;
- NPWS [now known as the Department of Environment and Conservation ("DEC")], 1995 *Vertebrates of upper north-east New*

South Wales. A report by the New South Wales National Parks and Wildlife Service to the Natural Resources Audit Council;

- Parker, P. 1999 *A species impact statement for Reedy Creek Quarry*. A report to GeoLink Pty Limited; and
- Sheringham P., and J. Westaway 1995 *Significant vascular plants of upper north-east NSW*. A report by the NSW National Parks and Wildlife Service for the Natural Resources Audit Council. NPWS, NSW.

3.0 FIELD SURVEYS

A flora survey and fauna assessment was undertaken at the site on 4 September 2004. Flora transects were undertaken within the grassland, the sugarcane plantation and the adjoining grazing paddock identified for this proposal. A vegetation transect was undertaken along the edge of the sugar cane plantation due to its impenetrable nature and three transects were undertaken in a north-south direction in the grazing paddock (Fig. 1).

A vehicle and walking transect was conducted along the length of the pipeline route from the South Pacific Ocean at Kingscliff proximal to the Police Station, along a Public/Crown reserve via Marine Parade, Beach Street, Elrond Drive, Chinderah Road, Crescent Street and then westward to the site along a proposed new road adjacent to the sugar cane plantation (Fig. 1).

The fauna survey was limited to a habitat assessment both at the site and along the proposed pipeline route and to opportunistic sightings. A systematic trapping survey was unwarranted due to the depauperate nature of habitats at the site (including the pipeline route) and the little

likelihood that these habitats would support threatened species. A threatened species database search was conducted.

3.1 Vegetation

3.1.1 Air photo interpretation and field surveys

Vegetation was mapped over a coloured aerial photograph, provided by Australian Bay Lobster Producers, at a scale of approximately 1:4000. Vegetation patterns were ground truthed for accuracy (Fig. 2).

3.1.2 Vegetation classification, structure and floristics

The vegetation classification system adopted for this survey is based on a approach modified from Walker and Hopkins (1990). This system describes the components of the association in the following order:

- the first species is usually the most abundant in the tallest stratum;
- a second species is chosen when it is always present in the tallest stratum. In the absence of a tallest stratum species, the most abundant species in the next most conspicuous stratum is chosen. For those associations where several species dominate, these are listed in order of abundance;
- a third species is chosen from any stratum, usually a ground cover or shrub layer. It is used as an indicator species;
- the forest type refers to the distances between the crowns of adjacent trees (Table 1); and
- the height of the tallest stratum is defined by the terms 'low', 'mid-high', or 'tall' (Table 2).

The following features of the vegetation were noted:

- dominant trees, shrubs and ground covers; and

- plant species in the association (Appendix 1);

Table 1: Structural formation classes defined by growth form and crown separation (after Walker and Hopkins 1990)

Crown separation	Closed or dense	Mid-dense	Sparse	Very sparse	Isolated plants	Isolated clumps
Field criteria	Touching-overlapping	Touching-slight separation	Clearly separated	Well separated	Isolated	Isolated
Growth form						
Tree	Closed forest	Open forest	Woodland	Open woodland	Isolated trees	Isolated clumps of heath shrubs
Heath shrub	Closed heathland	Heathland	Open heath	Sparse heath	Isolated heath shrubs	Isolated clump of heath shrubs
Sedge	Closed sedgeland	Sedgeland	Open sedgeland	Sparse sedgeland	Isolated sedges	Isolated clump of sedges
Sod grass	Closed sod grassland	Sod grassland	Open sod grassland	Sparse sod grassland	Isolated sod grasses	Isolated clumps of sod grasses

Table 2: Height classes and names of various growth forms for non-rainforest associations (after Walker and Hopkins 1990)

Height in metres	Trees, vines	Shrubs, heath shrubs, chenopod shrubs, mallee (tree or shrub form)	Tussock and hummock grasses, forbs, rushes, sedges, ferns	Sod grasses, mosses, lichens, liverworts
20.01-35.01	Extremely tall	NA	NA	NA
12.01-20	Tall	NA	NA	NA
6.01-12	Mid-high	Extremely tall	NA	NA
3.01-6	Low	Very tall	Extremely tall	NA
1.01-3	Dwarf	Tall	Tall	Extremely tall
0.51-1	NA	Low	Mid-high	Tall
0.26-0.5	NA	Low	Mid-high	Tall
<0.25	NA	Dwarf	Low	Low

3.3 Fauna

3.3.1 Aims

Fauna habitats at the site and along the pipeline route were inspected and the likelihood of threatened species occurring was addressed by

using database records and local fauna survey reports (e.g., DEC; Parker 1999) (Table 3).

Table 3: Threatened fauna known from the area and their typical habitat requirements (Source Parker 1999, DEC data base records)

Scientific name	Common name	Habitat and recorded locations in northern NSW
Birds		
Glossy black cockatoo	<i>Calyptorhynchus lathami</i>	Woodland dominated by she-oaks. Recorded Cudgen, Ellangowan, Evans Head, Iluka, Yamba, Grafton, Mini Water and Station Creek (NPWS 1995). Terania Ck, Nullum State Forest, Tweed River, Reserve Ck, Sheep Station Ck, Border Ranges NP, Goongerry SF (State Forests 1996) and Kingscliff (per. recs.)
Mammals		
Common blossom bat	<i>Synconycteris australis</i>	Coastal heathland and littoral rainforest. Recorded Cudgen, Brunswick Heads (NPWS 1995), Broken Head, Lennox Head (pers rec.), Broadwater, Iluka, Yamba, Brooms Head, Minnie Water, Moonee Beach (NPWS 1995) and Mooball SF, Nullum SF, Mt Warning NP (State Forests 1996)
Black flying fox	<i>Pteropus alecto</i>	Littoral and subtropical rainforest, mangrove swamps. Recorded Tweed Heads, Cudgen, Brunswick Heads (NPWS 1995), Byron Bay (pers record), Broadwater, Evans Head (NPWS 1995) and Mebbin SF, rural garden near Murwillumbah (State Forests 1996)
Grey-headed flying fox	<i>Pteropus poliocephalus</i>	Forests, woodlands, wetlands, riparian habitats and coastal heathland
Little bent-wing bat	<i>Miniopterus australis</i>	Forests, woodlands and coastal heaths. Recorded at Tweed Heads, Cudgen, Brunswick Heads, Lennox Head, Broadwater, Tuckean, Ellangowan, Evans Head, Bundjalung, Yamba, Brooms Head, Grafton Minni Water, Station Creek, Moonee Beach (NPWS 1995), Byron Bay, Suffolk Park, Broken Head (pers. recs.) and Mebbin, Nullum, Mooball, Whian Whian and Goongerry SFs (State Forests 1996)

4.0 RESULTS

4.1 Vegetation associations

The site was dominated by grassland comprising of a sugar cane, *Saccarum officinarum*, annual weeds or grasses (e.g., blue billygoat weed, *Ageratum houstonianum*, canary seed grass, *Setaria sphacelata*) and fringed along the new Pacific Highway by a small band of swamp she-oak, *Casuarina glauca* (Fig. 2).

The pipeline route along the roadside verge was also dominated by environmental weeds. However, introduced landscape species combined with paved areas were noted in the Kingscliff Urban environment.

Table 4: Vegetation associations (Fig. 2)

Woodland

Casuarina glauca (swamp she-oak) mid-high to tall open woodland

Grassland

Saccarum officinarum (sugarcane) mid-high to tall closed grassland

Setaria sphacelata (canary seed grass), *Ageratum houstonianum* (blue billygoat weed), *Chloris gayana* (Rhode's grass) mid-high open grassland

4.1.1 Woodland

Casuarina glauca (swamp she-oak) mid-high to tall open woodland

A small band of swamp she-oak screens the site from the new Pacific Highway (Figs. 2 & 3). Trees were clumped and substantial canopy gaps were noted. Invasive ground covers (e.g., molasses grass, *Melinis minutiflora*) retarded the regeneration of native plants. The association has limited conservation value which can be enhanced by reafforestation, landscape plantings and weed control.

4.1.2 Grassland

Saccarum officinarum (sugarcane) mid-high to tall closed grassland

Sugarcane has been grown at the site but poor plant strains combined with a reduction in the viability of this rural sector limits its future (Wayne Evans pers. com). Approximately half of the flats at the site remain under cane, the remainder being sown to improved pasture

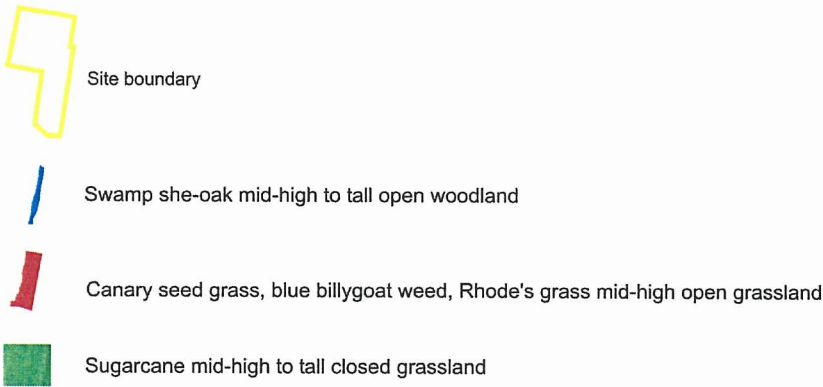
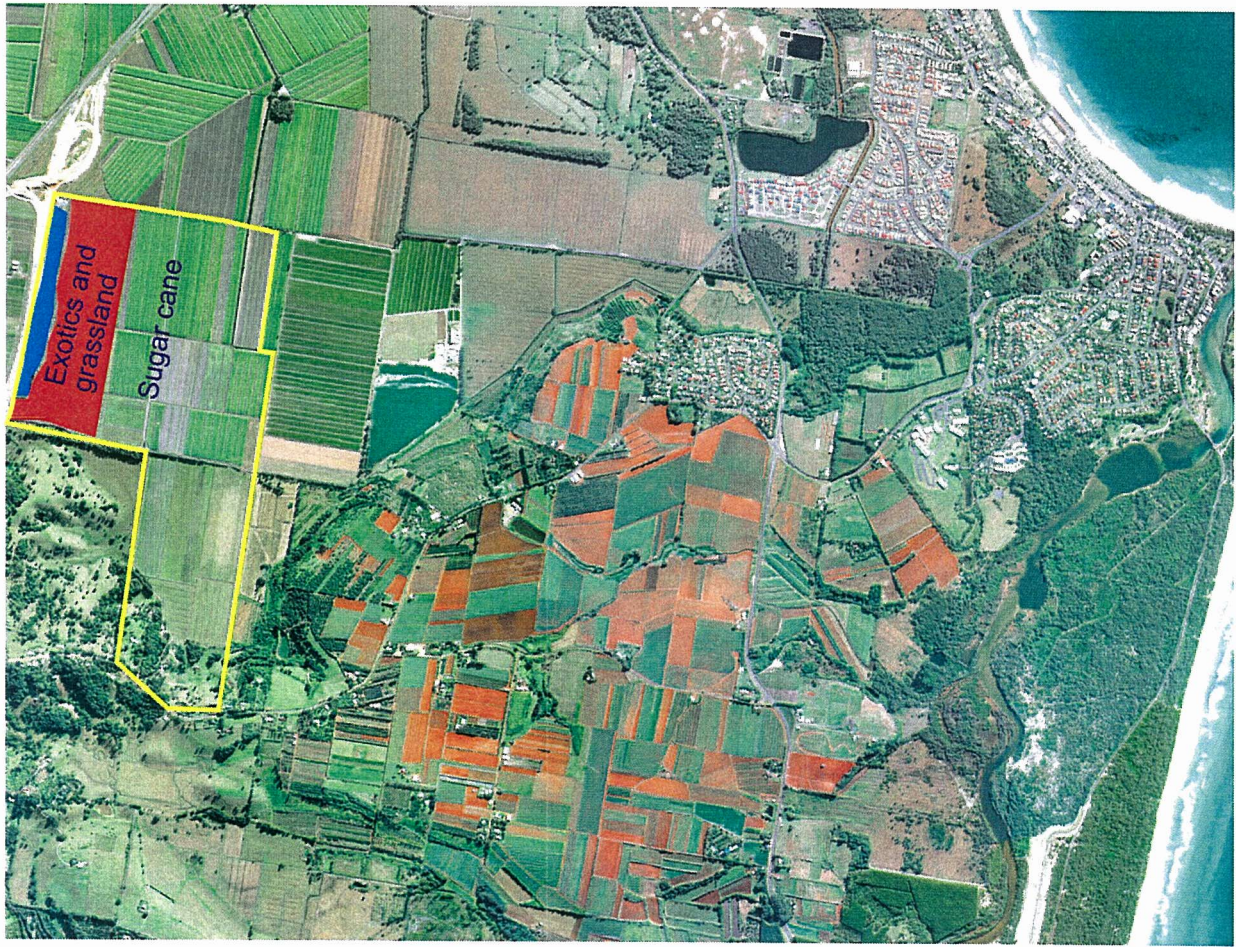
(Rhode's grass and canary seed grass) (Figs. 2 & 3). The area proposed for stages one and two have yet to be planted with improved pastures. The association has little conservation value.

Setaria sphacelata (canary seed grass), *Ageratum houstonianum* (blue billygoat weed), *Chloris gayana* (Rhode's grass) mid-high open grassland

This association is comprised of a mixture of exotic grasses and environmental weeds. The land occupied by this association was recently under sugar cane but remained fallow due to poor returns from cane. The abundant supply of exotic weed seed proliferated to the extent that virtually no native plant was recorded. The association has little conservation value (Figs. 2 & 3).

4.1.3 Plants of conservation significance

No threatened plant species pursuant to the *Threatened Species Conservation Act 1995* (TSC Act) was recorded or is expected to occur either at the site or along the pipeline route.



Peter Parker

Project: Aquaculture

Client: Australian Bay Lobster Producers

Fig. 2: Vegetation

Source: Australian Bay Lobster Producers Date: September 2004 Scale m 0 — 500





Plate 1: sugar cane; location of stage 3

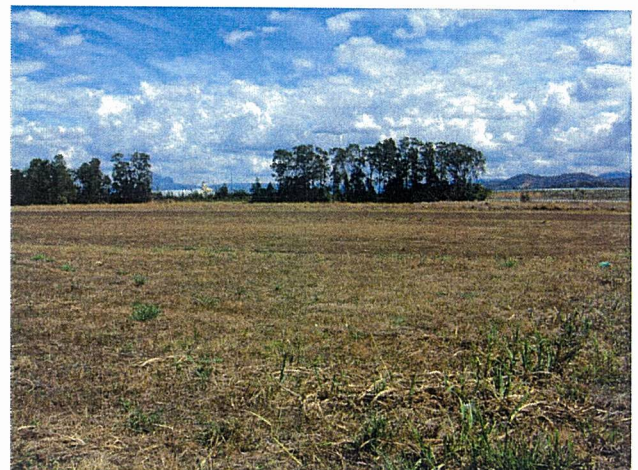


Plate 2: Exotics and grassland; location of stages 1 & 2

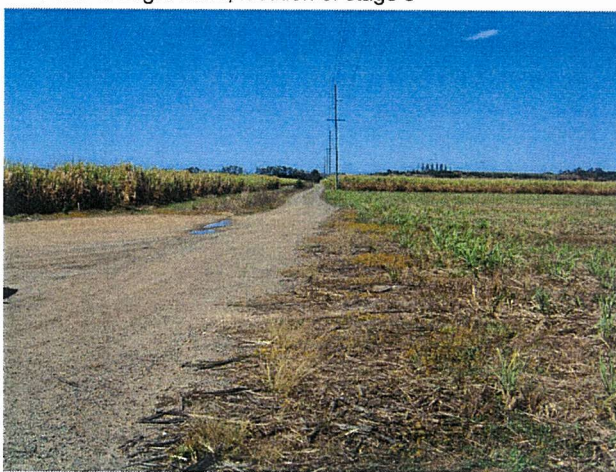


Plate 3: pipeline route in vicinity of site

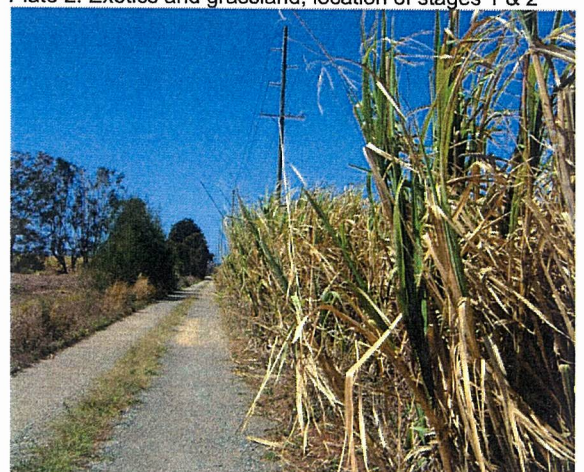


Plate 4: pipeline route adjacent to cane farms (see Fig. 2)

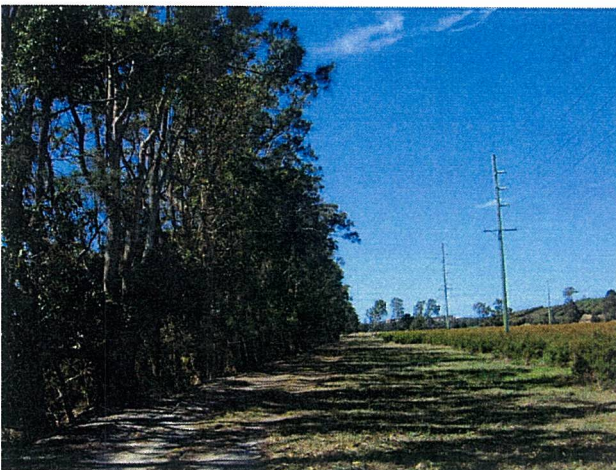


Plate 5: pipeline route near tea tree plantation



Plate 6: pipeline route near sewage treatment plant



Peter Parker

Project: Aquaculture

Client: Australian Bay Lobster Producers

Fig. 3: Plates

Source: Peter Parker

Date: September 2004

4.2 Fauna

4.2.1 Reptiles

Dry weather combined with highly degraded habitat militated against recording reptile density or diversity. However, the eastern grass skink, *Lampropholis delicata* was recorded in roadside vegetation and the water dragon, *Physignathus lesueurii*, was noted in drains near the pipeline route.

Species expected to be attracted to forage on introduced rats and mice in the sugar cane include the brown tree snake, *Boiga irregularis*, and the carpet python, *Morelia spilota* (Appendix 2).

4.2.2 Frogs

A number of frog species may occur in the drain located proximal to the pipeline route, although only the cane toad, *Bufo marinus*, is expected at the site. Frogs known to occur in disturbed and degraded sites include the common froglet, *Crinia signifera*, the striped marsh frog, *Limnodynastes peroni*, and the eastern dwarf tree frog, *Litoria fallax*. It is unlikely that vulnerable species would occur due to the absence of suitable habitat.

4.2.3 Birds

The site supported few open country birds species, although bird assemblages increased and diversified closer to the Tweed sewage treatment plant. Only three open country bird species were recorded at the site further demonstrating its lack of conservation value. These

were Richard's pipit, *Anthus novaeseelandiae*, the torresian crow, *Corvus orru* and the welcome swallow, *Hirundo neoxena*. The white-faced heron, *Egretta novaehollandiae*, was noted foraging in the drain adjacent to the pipeline route near the site and a number of species including the grey fantail, *Rhipidura fuliginosa*, the leaden flycatcher, *Myiagra rubecula*, the grey shrike-thrush, *Colluricincla harmonica*, the white-browed scrubwren, *Sericornis frontalis*, the silvereye, *Zosterops lateralis* and the brown honeyeater, *Lichmera indistincta* were recorded in swamp she-oaks and coast banksias, *Banksia integrifolia* var. *integrifolia* located adjacent to Council's sewage treatment plant.

4.2.4 Mammals

Suitable habitat occurs at the site for a number of common vertebrate fauna (Appendix 2). For example, rabbit, *Oryctolagus cuniculus*, scats were common along the roadside verge in the vicinity of the site and a brown hare, *Lepus capensis*, was sighted near Council's sewage treatment plant.

It is anticipated that the black rat, *Rattus rattus*, and house mouse, *Mus domesticus*, would be common in the cane fields.

Little habitat exists for native mammals, although the water rat, *Hydromys chrysogaster*, may occur in the drainage channel along the roadside edge.

4.2.4.1 Koala habitat

An assessment of potential koala habitat was undertaken pursuant to the requirements of State Environmental and Planning Policy No. 44 (SEPP 44) (Koala Habitat Protection). No koala food trees were

recorded at the site and it was concluded that potential koala habitat does not occur.

5.0 DISCUSSION

5.1 Threatened fauna

Threatened species are not expected to utilise the site but several species may fly over the site to access feeding or roosting areas elsewhere (see Table 3 and Appendix 2). These species habitat requirements are included in the “8 part test” (s.5A assessment) below.

5.2 Environmental management

Some management measures may enhance the environmental values of the site and are compatible with the proposed development. These include:

- the use of locally sourced native plants in landscaping;
- weed control and restoration of the swamp she-oak woodland fronting the new Pacific Highway; and
- buffer plantings between the proposed development and the adjacent cane farms.

6.0 STATUTORY CONSIDERATIONS

The *Threatened Species Conservation Act 1995* (“TSC Act”) commenced on 1 January 1996. This Act, *inter alia*, amended s4, s110, s111 and s112 of the *Environmental Planning and Assessment Act, 1979* with regard to the protection of plants and animals.

The following factors have been considered in assessing the likelihood that a *viable local population* of a species will be placed at risk of extinction from this proposal:

- the proposal's likely impact upon the key habitat components essential to the species' lifecycle; and
- the size of the local population in comparison with that which is proposed to be removed/modified.

A desktop assessment of threatened plant and animal species likely to use the habitats recorded at the site was undertaken. Species were excluded from the assessment if:

- key habitat components for those species are not present within or near the area under application; and/or
- no records for those species have been recorded within 5 km of the study site; and/or
- available information on the species precludes it from being considered as likely to use habitat within the area under application because of nesting and/or migratory behaviour.

Section 5A is used to determine whether a proposed development is likely to significantly affect threatened species, populations or ecological communities or their habitats. Section 5A requires the following factors to be taken into account:

S5A(a)

in the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction

A local population is considered to be the population contained within interconnected suitable habitat within a 5 km radius of the study site.

Flora

No threatened plant species was recorded. Thus, the proposal would not disrupt *a viable local population of any threatened plant species*.

Similarly, *the life cycle of any species is unlikely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction*.

Fauna which are known from the general area and where suitable habitat occurs at the site

Glossy black-cockatoo

The glossy black-cockatoo is the smallest of the black-cockatoos (48 cm). This species is brownish-black and has two bright red (male) or yellow (female) panels in the tail. There are few measures of abundance for this species. However, Morris *et al.* 1981 consider that it is moderately common in northern NSW. It lives in permanent groups of up to 10 individuals, roosting communally at night and travelling at dawn to groves of seeding she-oaks to feed.

Distribution

Australia

The glossy black-cockatoo ranges from Rockhampton, Queensland to southern Victoria. It has also been recorded at islands off the South Australian coast (RAOU Atlas Map 265). It frequents open forests and woodlands extending into semi-arid areas.

NSW

The glossy black-cockatoo ranges from the Queensland to the Victorian borders extending to the west of the Great Dividing Range. It is widely distributed in the south-east of the State, having been recorded in the Eden State Forest management area (State Forests 1996).

Northern Rivers region

This species has been recorded at Cudgen, Ellangowan, Evans Head, Iluka-Woombah, Yamba and Grafton (NPWS 1995). It was also recorded from 32 locations in the Dorrigo area and from 118 locations in most forest types in the Dorrigo and Grafton State Forest management areas. Moreover, it has been recorded from virtually all State Forest management areas in the north coast region (State Forests 1996).

The study area and surroundings

This species was recorded at various coastal sites during the NRAC survey (NPWS 1995) and during the CSIRO survey of the Murwillumbah State Forest management area. Specific local records include Terania Creek, Nullum State Forest, Tweed River, Reserve Creek, Sheep Station Creek in the Border Rangers National Park, Lavery's Gap, Cudgen Lake (above Coopers Creek) and at Whian Whian State Forest (State Forests 1996). Thus, it is likely to visit the study area on a seasonal basis when the she-oaks are in fruit.

Critical habitat supporting essential behaviour patterns

This species feeds on the seeds of a few species of she-oaks (e.g., *Allocasuarina torulosa*, *A. littoralis* and *A. stricta*). It breeds in large

tree hollows and is therefore threatened by the gradual loss of forested habitat that contains these essential requirements.

General threats to survival and impacts of the proposal

The major threat to the survival of the glossy black-cockatoo is the loss, through clearing or burning, of she-oaks in forest and woodland habitats. It is unlikely that the proposal will have any impact on this species as its preferred habitat, she-oaks, will be preserved.

Common blossom bat

The common blossom bat is a small winged placental mammal that feeds on nectar. It has a long thin brush-like tongue and a slim pointed muzzle. Its long soft reddish-brown fur extends to the ankle. It is paler below and flecked with white (Cronin 1991). This species can be quite common under suitable environmental conditions and densities of between 1 to 17.5 bats/ha have been recorded (Law 1994).

Distribution

Australia

This species has been recorded east of the ranges from Cape York in Queensland to the mid-north coast of NSW.

NSW

The common blossom bat occurs along the coastal region east of the Great Dividing Range from the Queensland border to approximately Taree where littoral rainforest and heath occur in close proximity.

Rainforest, unlike more open habitats, is important for roosting purposes enabling bats to maintain a stable body temperature (Law 1993).

Northern Rivers region

The blossom bat has been recorded at Wooyung (Hoye 1994), Kingscliff (Australian Museum), Cudgen, Brunswick Heads (NPWS 1995), Byron Bay and Broken Head (pers. records), Broken Head (Milledge 1991), Lennox Head (NPWS 1995), Iluka Bluff, Bundjalung National Park, Yuraygir National Park (Law 1994), Yamba and Brooms Head (NPWS 1995).

The study area and surroundings

The common blossom bat was not recorded at the study site. However, based on the number of local records, it may periodically fly over the site when suitable food sources in the area are available. It was recorded in Mooball State Forest during the CSIRO fauna survey of the Murwillumbah State Forest management area (State Forests 1996).

Critical habitat supporting essential behaviour patterns

The common blossom bat forages extensively in coastal heaths and usually roosts in proximity to these feeding sites. In NSW feeding sites, it is considered a strict nectivore, whereas in north-east Queensland it is a facultative frugivore and to a lesser extent a folivore (Law and Spencer 1995).

General threats to survival and impacts of the proposal

The dominant threat to this species is the clearing of foraging and roosting habitats. Clearing removes essential habitat and places movement barriers between local populations. It is unlikely that the proposal will have a significant impact on this species as no habitat will be disturbed.

Black flying fox

The black flying-fox is a winged placental mammal with soft dark brown to black fur above which is sometimes reddish-brown on the shoulders and on the back of the neck. It is often flecked with grey below (Cronin 1991). It is the largest of the flying foxes with a head and body length of 24 to 26 cm. Camps of up to several thousand individuals have been recorded in broad-leaved paperbark swamps (Hall 1995). Low numbers occur in northern NSW where it is at the southern limit of its distribution.

Distribution

Australia

The black flying-fox ranges along the Australian coastline north from Shark Bay in Western Australia to include the Northern Territory and Cape York. The southern extreme of its range is approximately Grafton on the NSW coast (Strahan 1992). It feeds on the blossom of eucalypts, broad-leaved paperbark, turpentine and native and introduced fruits (Hall 1983). It often congregates during the day with the grey-headed flying-fox in rainforests or in swamps.

NSW

It has a limited distribution along the NSW coastal zone from the Queensland border to approximately Grafton (Hall 1995).

Northern Rivers Region

This species has been recorded in camps at Susan Island in Grafton and at Curry Park, Lismore. Camps have also been recorded at North Ocean Shores and at Booyong.

The Study Area and Surroundings

It was recorded by the CSIRO in the Murwillumbah State Forest management area at Mebbin State Forest and in a domestic garden in Murwillumbah (State Forests 1996).

Critical habitat supporting essential behaviour patterns

This species is mainly frugivorous, feeding on a range of rainforest fruits (e.g., black apple, *Planchonella australis*, cockspur vine, *Maclura cochinchinensis*, mistletoe, *Notothixos cornifolius* and several species of figs) and non-rainforest species (e.g., broad-leaved paperbark, *Melaleuca quinquenervia* and coast banksia, *Banksia integrifolia* var. *integrifolia*) (McWilliam 1986). Camps are often situated in rainforest, broad-leaved paperbark swamps or mangroves (Hall 1995).

General threats to survival and impacts of the proposal

The main threats to this species appear to be the clearing of native forests. Mortality from powerlines and the shooting of bats raiding orchards may pose additional pressures on populations. It is unlikely that the proposal will have any impact on this species and no foraging or roosting habitat will require removal.

Grey-headed flying fox

Distribution

Australia

This species is distributed along the eastern Australian coastline from Gladstone in Queensland to south Gippsland and Melbourne in Victoria. It rarely travels more than 200 km inland.

NSW

The grey-headed flying fox is distributed along the NSW coastal zone from the Queensland to the Victorian borders.

Northern Rivers Region

Large camps occur at Susan Island in the Clarence River and at Wingham Brush, Taree.

The Study Area and Surroundings

This species is commonly observed throughout coastal shires, particularly at sunset when departing from roosting sites.

Critical habitat supporting essential behaviour patterns

The grey-headed flying fox feeds on the blossom of eucalypts, paperbarks, turpentine and native and introduced fruits. It often congregates during the day with the black flying-fox in swamps or rainforests.

General threats to survival and impacts of the proposal

Clearing of native forests has reduced foraging resources while mortality from powerlines and shooting of bats raiding orchards pose additional pressures on populations. It is unlikely that the proposal will have any impact on this species and no foraging or roosting habitat will require removal.

Little bent-wing bat

The little bent-wing bat is characterised by an exceptionally long terminal segment of the third finger. This placental flying mammal is greyish black to fawn-brown above and paler below.

This species utilises caves, old mines and a variety of structures such as buildings and stormwater drains as diurnal roosts. It forages on small insects below the tree canopy of well timbered habitat and relies on a limited number of caves for maternity and hibernation roosts (Dwyer 1983c). With the onset of spring, adult females move from widely scattered roosts to specific nursery caves. These sites are often shared with the common bent-wing bat. The little bent-wing bat relies on large numbers of the common bent-wing bats to raise cave temperatures to that necessary to raise young (Dwyer 1983b; Baudinette *et al.* 1994).

Distribution

Australia

The little bent-wing bat frequents the coastal ranges of eastern Australia from the central coast of NSW to Cape York. It is considered abundant nationally (Dwyer 1995)

NSW

This species occurs in north-eastern coastal areas of NSW, extending from the Queensland border to the central coast. Its distribution becomes increasingly coastal towards the southern extreme of its range.

Northern Rivers region

Recorded at Tweed Heads, Cudgen (NPWS 1995), Tumbulgum (pers. record), Brunswick Heads (NPWS 1995), Broken Head (pers. record), Lennox Head, Broadwater, Tuckean, Ellangowan, Evans Head, Bundjalung, Iluka-Woombah (NPWS 1995) Corindi (pers. record) and Grafton (NPWS 1995). It was widely distributed and recorded in most

State Forest management areas in northern NSW (State Forests 1996).

The study area and surroundings

This species is known to roost at Nimbin Rocks (State Forests 1996) but is unlikely to roost in the vicinity of the site.

Critical habitat supporting essential behaviour patterns

This species occurs in a wide range of forest types ranging from rainforest to warm temperate wet and dry sclerophyll forests. These forest types were not represented at the site.

General threats to survival and impacts of the proposal

The major threat to the survival of the little bent-wing bat is the disturbance of maternity sites. Maternity caves may be threatened by mining, recreational cavers and vandalism. However, this species may be indirectly threatened through a drop in bat density and the resultant variation in cave microclimate. Although this species is predominantly cave-roosting, there is at least one record of it roosting in trees (M. Schultz, pers. comm.). Loss of foraging resources by clearing native forest is likely to impose an increasing threat to the survival of this species. It is unlikely that the proposal will have any impact on this species and no foraging or roosting habitat will require removal.

S5A(b)

in the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised

No endangered populations, listed under Part 2 of Schedule 1 of the TSC Act occur within the vicinity of the site. Thus, the proposed activity will not disrupt the life cycle of any species constituting an endangered population and will not significantly compromise the viability of any endangered population.

S5A(c)

in relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed

In determining whether a significant area of known habitat is to be modified or removed in relation to the regional distribution of the habitat of a threatened species, population or ecological community, an assessment needs to consider the following characteristics of the site:

- its relative scale and remnant value;
- its habitat quality; and
- its setting in the landscape at the regional scale.

For the purpose of this assessment “a region” is considered to be a bioregion defined in the national system of bioregionisation (see part “f” of this assessment). An area will be considered to contain “*known habitat*” for a species if it is similar to the known habitat preferences of that species and lies within its known range.

The site is arguably one of the most degraded natural landscapes in the Tweed Shire being dominated by environmental weeds. The proposal will not require a *significant area of known habitat* will to be *modified or removed*.

S5A(d)

whether an area of habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for threatened species, population or ecological community

“Interconnecting or proximate areas of habitat” are taken to be two or more areas of habitat where individuals could potentially move from one to the other. Areas are considered “*likely to become isolated*” if it is predicted that the proposal creates a situation preventing future movement of individuals between these areas.

In this assessment, consideration is given to the local ‘connectivity values’ of the site; whether the site is contributing to the local movement patterns of any threatened species and whether the proposal would significantly disrupt these patterns.

The site does not form part of a known fauna movement corridor. Thus, the proposal will not cause *an area of* known fauna habitat to *become isolated from currently interconnecting or proximate areas of habitat*.

S5A(e)

whether critical habitat will be affected

The site does not contain any area which has been identified and declared as critical habitat under Part 3 of the TSC Act. Therefore, critical habitat will not be affected by the proposal.

S5A(f)

whether a threatened species, population or ecological

community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region

The Australian Nature Conservation Agency (ANCA) has developed a system of biogeographic regionalisation for Australia (IBRA). This system was developed for the purpose of establishing a national comprehensive system of parks and reserves. A biogeographic region can be defined as *“a complex land area composed of a cluster of interacting ecosystems that are repeated in similar form throughout”* (Thackway and Cresswell 1995). A biogeographic region describes the dominant landscape, scale of climate, lithology, geology, landforms and vegetation. IBRA has been derived through a combination of expert ecological knowledge and interpretation of existing State and Territory regionalisations. On 31 May 1996, the Director General, NPWS gave notice that pursuant to s.4(1) of the *TSC Act* and s.4(6A) of the *EPA Act* 1979, the national system of biogeographic regionalisation, identified by Thackway and Cresswell (1995), “is appropriate for the purposes of the provisions in which the term ‘region’ is used”.

Biogeographic regions provide a framework for summarising patterns in nature conservation. They are an ecologically meaningful approach to defining a region, as they are based upon a conceptual model which seeks to describe and explain a regional pattern of biological diversity and productivity. The north coast region has the IBRA code NNC and the IBRA name *NSW North Coast* (Thackway and Cresswell 1995). In determining the reservation status within this biogeographic region, Thackway and Cresswell (1995) calculated that reserved areas

accounted for approximately 5-10% of the total area of the NNC region (60,794 km²) and that the existing reserves in the region fail to include samples of the most extensive ecosystems (or land systems) i.e. those that characterise entire sub-regions to a "moderate" degree.

Threatened species which may occur seasonally or opportunistically in the locality are wide-ranging and are represented in a number of conservation reserves in the NNC region.

S5A(g)

whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process

A threatening process is defined under the TSC Act as a process that threatens, or may have the capability to threaten the survival or evolutionary development of species, populations or ecological communities.

Threatening processes include the following:

- Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands;
- Anthropogenic climate change;
- Bushrock removal;
- Clearing of native vegetation. Clearing is defined as the destruction of a sufficient proportion of one or more strata (layers) within a stand or stands of native vegetation so as to result in the loss, or long-term modification, of the structure, composition and ecological function of a stand or stands;

- Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus*;
- Competition from feral honey bees, *Apis mellifera*;
- High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition. High frequency fire is defined as two or more successive fires close enough together in time to interfere with or limit the ability of plants or animals to recruit new individuals into a population, or for plants to build up a seed-bank of sufficient size to maintain the population through the next fire;
- Importation of Red Imported Fire Ants, *Solenopsis invicta*;
- Infection by *Psittacine Circoviral* (beak and feather) disease affecting endangered psittacine species and populations;
- Infection of native plants by the fungus *Phytophthora cinnamomi*;
- Loss or degradation (or both) of sites used for hill-topping by butterflies. Hill-topping in butterflies is a complex behaviour that often facilitates mating between sexes. Many butterfly species appear to congregate on hill-tops or ridges that are usually higher than the surrounding landscape. These sites may range in area from a few square metres to several hectares;
- Invasion of native plant communities by bitou bush, *Chrysanthemoides monilifera*. The ability of bitou bush to become the overwhelming dominant in invaded ecological communities threatens all plant communities within its distribution;
- Predation by the mosquito fish, *Gambusia holbrooki*;
- Predation by the European red fox, *Vulpes vulpes*;

- Predation by the feral cat, *Felix cattus*. Predation by the feral cat has been implicated in the extinction and decline of many species of birds on islands around Australia and in the early extinction of up to seven species of small mammals on the Australian mainland; and
- Predation by the ship rat *Rattus rattus* on Lord Howe Island.

In relation to the above:

- The proposal will not alter the natural flow regimes of rivers or streams;
- Anthropogenic climate change is unlikely to occur due to the small scale of the proposal;
- Bushrock will not be removed from the site;
- Clearing of native vegetation: Clearing as defined by the Scientific Committee is not required;
- The proposal will not contribute to an increase in fire frequency;
- The proposal will not increase competition and grazing by the feral European Rabbit;
- The proposal will not increase the competition from feral honey bees;
- The proposal will not result in the importation of Red Imported Fire Ants;
- The proposal will not increase infection by *Psittacine Circoviral* disease affecting endangered psittacine species and populations.
- The proposal will not increase the infection of native plants by *Phytophthora cinnamomi*;

- Loss or degradation of sites used for hill-topping by butterflies. The survey did not reveal the use of the site by hill-topping butterflies;
- Bitou bush was recorded. However, the proposal will not alter the impact of bitou bush on native plant communities;
- The mosquito fish was not recorded and is unlikely to occur at the site due to the lack of fish habitat;
- The fox was not recorded although it is known from the local area. The proposal is unlikely to alter the density of this species;
- The feral cat was not recorded at the site and the proposal is unlikely to alter the density of this species; and
- The Lord Howe Island Ship rat does not occur at the site. Thus, the proposal will not impact on this species.

S5A(h)

whether any threatened species, population or ecological community is at the limit of its known distribution

No threatened species at the site is at the limit of its known distribution.

6.1 Section 5A, conclusion

Based on available information:

- No viable populations of the species detailed under (a) are likely to be placed at risk of extinction;
- The viability of endangered populations will not be significantly compromised;
- No regionally significant area of known habitat will be removed;
- No known habitat for threatened species will become isolated;
- No critical habitat will be affected;

- The occasional use of the site by threatened species is likely to be limited to those which opportunistically fly over to access foraging sites elsewhere. These species are represented in nearby national parks or nature reserves;
- The proposed development is not a key threatening process under Schedule 3 of the TSC Act, and threatening processes listed under the TSC Act are not likely to increase; and
- No threatened species which may opportunistically occur at the site is at the limit of its known distribution;

6.2 *Environmental Protection and Biodiversity Conservation Act, 1999*

Under the *Environment Protection and Biodiversity Conservation Act, 1999* ("EPBC Act"), an action will require approval from the Federal Minister for the Environment ("the Minister") if:

- The action has, will have, or is likely to have a significant impact on a matter of national environmental significance; and
- The action is not subject to one of the exceptions identified below.

The matters of national environmental significance are:

- World Heritage properties;
- RAMSAR wetlands of international importance;
- Listed threatened species and communities;
- Migratory species protected under international agreements;
- Nuclear actions; and
- The Commonwealth marine environment.

If a proposed action is not covered by one of the exceptions identified below under heading 6.2.2, a person proposing to take an action that he or she thinks will have, or is likely to have, a significant impact on a

matter of national environmental significance must refer that action to the Minister.

The Minister will decide whether the action will, or is likely to, have a significant impact on a matter of national environmental significance. If the Minister decides that the action is likely to have a significant impact on a matter of national environmental significance, then the action requires approval under the EPBC Act. If the Minister decides that the action is not likely to have a significant impact on a matter of national environmental significance, then the action does not require approval under the Act.

The Minister is generally required to make a binding decision on whether an action requires approval within 20 business days of receiving a referral (in some cases the decision must be made within 10 business days). If the Minister's decision is that an action does not require approval, a person will not contravene the Act if the action is taken in accordance with that decision.

If the Minister decides that an action requires approval, then an environmental assessment of the action must be carried out. The Minister decides whether to approve the action, and what conditions (if any) to impose, after considering the environmental assessment.

6.2.1 Determining whether an action is likely to have a significant impact

The criteria intended to assist in determining whether the impact of an action on any matter of national environmental significance is likely to be significant are as follows:

- On-site and offsite impacts;

- Direct and indirect impacts;
- The frequency and duration of the action;
- The total impact which can be attributed to that action over the entire geographic area affected and over time;
- The sensitivity of the receiving environment; and
- The degree of confidence with which the impacts of the action are known and understood.

The EPBC Act provides that the Minister must, in deciding whether an action is likely to have a significant impact on a matter of national environmental significance, take account of the precautionary principle.

The EPBC Act provides that in deciding whether the action is a controlled action, the Minister must not consider any beneficial impacts that the action has, will have or is likely to have.

6.2.2 Exceptions

An action does not require approval from the Minister under the Act if:

- The action is approved under, and taken in accordance with, a State management plan that is accredited by the Commonwealth for the purposes of a bilateral agreement (see section 46 of the Act), or
- The action is approved under, and taken in accordance with, a Commonwealth management plan that is accredited by the Minister for the purposes of a Ministerial declaration (see section 33 of the Act), or
- The action is a forestry operation taken in a Regional Forest Agreement region (see Part 4, Division 2 of the Act), or
- The action is taken in the Great Barrier Reef Marine Park and is authorised by certain instruments issued under the Great Barrier Marine Park Act 1975 (see section 43 of the Act), or

- The action has been authorised by a Government decision on which the Minister's advice has been sought (see section 160 of the Act), or
- The action was authorised by the Commonwealth, a State or a Territory prior to the EPBC Act commencing (16 July 2000); and
- At the time the EPBC Act commenced, no further authorisation is required to allow the action to be lawfully taken.

Finally, the EPBC Act provides that approval is not required for an action that is a lawful continuation of a use of land, sea or seabed that was occurring immediately before the commencement of the Act (This exception does not apply to an enlargement, intensification or expansion of an existing use).

6.2.3 Conclusion

On a review of the above, the subject proposal does not significantly affect World Heritage values (Part 3 Divn. 1 EPBC Act), wetlands of international importance, listed threatened or endangered species, any endangered community, any listed migratory species, any Commonwealth land and any bilateral agreement between the State and Commonwealth. Thus, the proposal does not need referral to the Commonwealth.

7.0 REFERENCES

- Baudinette, R.V., Wells, R.T., Sanderson, K.J. and B. Clark 1994 Microclimatic conditions in maternity caves of the bent-wing bat, *Miniopterus schreibersii*: an attempted restoration of a former maternity site. *Wild. res.* 21:607-19.
- Dwyer, P.D. 1983 Little Bent-wing Bat *Miniopterus australis*. Pp 338-39 in *The Australian Museum Complete Book of Australian Mammals* ed by R. Strahan. Angus & Robertson Publishers: Sydney.

- Dwyer, P.D. 1983b Little bent-wing bat *Miniopterus australis*. Pp 338-39 (In) *The Australian Museum complete book of Australian mammals* ed by R. Strahan. Angus & Robertson Publishers: Sydney.
- Dwyer, P.D. 1995 Flight patterns of some eastern Australian bats. *Vict. Nat*, 82:36-41.
- Hall, L.S., 1983 Black flying fox (*Pteropus alecto*). (In) Strahan (ed) *The Australian Museum Complete Book of Australian Mammals* Angus & Robertson Sydney, pp280-281.
- Hall, L.S., 1995 Black flying-fox, *Pteropus alecto*, (Temmink, 1837). (In) Strahan (ed) *The Australian Museum Complete Book of Australian Mammals* Angus & Robertson, Sydney pp432-433.
- Hoye, G.A. 1994 A survey of the bat fauna of the area proposed for extensions to Mt Owen open cut mine. An unpublished report.
- Law, B.S. 1993 Roosting and foraging ecology of the common blossom bat (*Syconycteris australis*) in north-eastern NSW: Flexibility in response to seasonal variation. *Wildl. Res.* 20: 419-431.
- Law, B.S. 1994 *Banksia* nectar and pollen: Dietary items affecting the abundance of the common blossom bat, *Syconycteris australis*, in southeastern Australia. *Aust. J. of Ecol.* 19: 425-434.
- Law, B.S. and H.J. Spencer 1995 Common blossom bat, *Syconycteris australis*, (Peters, 1867). (In) Strahan, R. (ed) *Mammals of Australia* pp. 423-425. The Australian Museum and Reed Books, Sydney.
- NPWS 1995 *Vertebrates of upper north-east New South Wales*. A report by the New South Wales National Parks and Wildlife Service to the Natural Resources Audit Council. Publ. National Parks and Wildlife Service.
- Parker, P. 1999 *A species impact statement for Reedy Creek Quarry*. A report to GeoLink Pty Limited.
- Sheringham P., and J. Westaway 1995 *Significant vascular plants of upper north-east NSW*. A report by the NSW National Parks and Wildlife Service for the Natural Resources Audit Council. NPWS, NSW.
- State Forests 1995 Environmental impact statement for the proposed forestry operations in the Coffs Harbpour and Urunga management areas. A report prepared by State Forests, NSW.

- State Forests, 1996 *Environmental impact statement for the proposed forestry operations in the Murwillumbah management area. A report prepared by State Forests, NSW*
- Walker, J. and M. S. Hopkins 1990 *Vegetation in Australian soil and land survey field handbook* ed by R. C. McDonald, R. F. Isbell, J. G. Speight, J. Walker and M. S. Hopkins. Inkata Press: Melbourne.

APPENDIX 1:

VEGETATION

Scientific name	Common name	Recorded at site	Recorded at or near pipeline route
ANGIOSPERMS (Flowering plants)			
Monocotyledons			
COMMELINACEAE			
<i>Commelina cyanea</i>	scurvy weed	x	
CYPERACEAE			
<i>Baumea articulata</i>	jointed twig-rush	x	
* <i>Cyperus eragrostis</i>	umbrella sedge	x	
PHILYDRACEAE			
<i>Philydrum lanuginosum</i>	woolly frogmouth	x	
POACEAE			
* <i>Axonopus affinis</i>	broad-leaved carpet grass	x	x
* <i>Chloris gayana</i>	Rhode's grass	x	
<i>Cynodon dactylon</i>	couch	x	x
* <i>Eragrostis curvula</i> (complex)	love-grass	x	x
* <i>Melinis minutiflora</i>	molasses grass	x	
* <i>Paspalum wettsteinii</i>	broad-leaved paspalum (warrel grass)	x	x
<i>Phragmites australis</i>	common reed	x	
* <i>Saccharum officinarum</i>	sugar cane	x	
* <i>Setaria sphacelata</i>	canary seed grass	x	x
* <i>Sorghum bicolor</i>	sorghum	x	
<i>Spinifex sericeus</i>	hairy spinifex	x	
* <i>Stenotaphrum secundatum</i>	buffalo grass	x	
Dicotyledons			
APOCYNACEAE			

<i>Parsonsia straminea</i>	common silkpod	x	
ASTERACEAE			
* <i>Ageratum houstonianum</i>	blue billygoat weed	x	
* <i>Ambrosia psilostachya</i>	perennial ragweed	x	
* <i>Biddens pilosa</i>	cobbler's pegs	x	x
* <i>Ceratogyne australis</i>	carrot weed	x	
* <i>Cirsium vulgare</i>	spear thistle	x	
* <i>Crassocephalum crepidioides</i>	thickhead	x	
* <i>Chrysanthemoides</i> spp. <i>rotundata monilifera</i>	bitou bush		x
* <i>Conyza albida</i>	tall fleabane	x	x
* <i>Erigeron bonariensis</i>	fleabane	x	
* <i>Senecio latus</i>	fireweed	x	x
CAPPARIDACEAE			
<i>Capparis arborea</i>	brush caper berry		x
CASUARINACEAE			
<i>Casuarina glauca</i>	swamp she-oak	x	
CONVOLVULACEAE			
* <i>Ipomea cairica</i>	coast morning glory	x	x
* <i>Ipomea indica</i>	blue morning glory		x
EUPHORBIACEAE			
<i>Macaranga tanarius</i>	macaranga	x	
* <i>Ricinus communis</i>	castor oil plant	x	
FABACEAE			
Subfamily FABOIDEAE			
* <i>Macroptilium atropurpureum</i>	siratiro	x	x
* <i>Trifolium repens</i>	white clover	x	x
LAURACEAE			
* <i>Cinnamomum camphora</i>	camphor laurel	x	

MALVACEAE			
<i>Hibiscus heterophyllus</i>	native Rosella	x	
* <i>Sida rhombifolia</i>	Paddy's Lucerne	x	x
OXALIDACEAE			
* <i>Oxalis</i> sp.	oxalis	x	x
PLANTAGINACEAE			
* <i>Plantago gaudichaudii</i>	narrow-leaf plantain	x	x
POLYGONACEAE			
* <i>Rumex brownii</i>	swamp dock	x	
SALVINIACEAE			
* <i>Salvinia molesta</i>	salvinia	x	
SAPINDACEAE			
<i>Cupaniopsis anarcardioides</i>	tuckeroo	x	
SOLANACEAE			
* <i>Solanum mauritianum</i>	wild tobacco	x	
VERBENACEAE			
* <i>Lantana camara</i>	lantana	x	x
* <i>Verbena bonariensis</i>	purple top	x	

APPENDIX 2:

FAUNA

SCIENTIFIC NAME	COMMON NAME	RECORDED AT SITE OR NEAR PIPELINE ROUTE	EXPECTED
* introduced species; # threatened species (TSC Act)			
MAMMALS			
CANIDAE			
<i>Canis familiaris</i> *	Dog	x	x
<i>Vulpes vulpes</i> *	Fox		x
FELIDAE			
<i>Felis catus</i> *	feral cat		x
LEPORIDAE			
<i>Lepus capensis</i> *	brown hare		x
<i>Oryctolagus cuniculus</i> *	Rabbit	x	x
MOLOSSIDAE			
<i>Mormopterus sp.1</i>			x
<i>Nyctinomus australis</i>	white-striped mastiff bat		x
MURIDAE			
<i>Hydromys chrysogaster</i>	water rat		x
<i>Mus domesticus</i> *	house mouse		x
<i>Rattus rattus</i> *	black rat		x
PERAMELIDAE			
<i>Isodon macrourus</i>	northern brown bandicoot		x
PTEROPODIDAE			
<i>Pteropus alecto</i> #	black flying-fox		x
<i>Pteropus poliocephalus</i> # Sch. 2 TSC; Vuln. EPBDCA	grey-headed flying-fox		
<i>Syconycteris australis</i> #	Queensland blossom-bat		x

TACHYGLOSSIDAE			
<i>Tachyglossus aculeatus</i>	short-beaked echidna		x
VESPERTILIONIDAE			
sub-family MINIOPTERINAE			
<i>Miniopterus australis</i> #	little bent-wing bat		x
sub-family NYCTOPHILINAE			
<i>Nyctophilus gouldi</i>	Gould's long-eared bat		x
sub-family VESPERTILIONINAE			
<i>Chalinolobus gouldii</i>	Gould's wattled bat		x
<i>Chalinolobus morio</i>	chocolate wattled bat		x
<i>Scotorepens orion</i>	eastern broad-nosed bat		x
<i>Scotorepens sp</i>	broad-nosed bat		x
<i>Vespadelus pumilus</i>	the eastern forest bat		x
BIRDS			
ACCIPITRIDAE			
<i>Aquila audax</i>	Wedge-tailed eagle		x
<i>Elanus axillaries</i>	black-shouldered kite		x
<i>Haliastur sphenurus</i>	whistling kite		x
ALCEDINIDAE			
<i>Alcedo azurea</i>	azure kingfisher		x
<i>Dacelo novaeguineae</i>	laughing kookaburra		x
ANATIDAE			
<i>Anas castanea</i>	chestnut teal		x
<i>Anas superciliosa</i>	Pacific black duck		x
ARDEIDAE			

<i>Egretta garzetta</i>	little egret		x
<i>Egretta ibis</i>	cattle egret		x
<i>Egretta intermedia</i>	intermediate egret	x	x
<i>Egretta novaehollandiae</i>	white-faced heron	x	x
ARTAMIDAE			
<i>Cracticus nigrogularis</i>	pied butcherbird		x
<i>Cracticus torquatus</i> grey	butcherbird		x
<i>Gymnorhina tibicen</i>	Australian magpie		x
<i>Strepera graculina</i>	pied currawong		x
CAMPEPHAGIDAE			
<i>Lalage leucomela</i>	varied triller	x	x
CHARADRIIDAE			
<i>Vanellus miles</i>	masked lapwing		x
COLUMBIDAE			
<i>Columba livia</i> *	feral pigeon		x
<i>Geopelia humerali</i>	bar-shouldered dove		x
<i>Geophaps lophotes</i>	crested pigeon		x
CORACIIDAE			
<i>Eurystomus orientalis</i>	dollarbird		x
CORVIDAE			
<i>Corvus orru</i>	torresian crow	x	x
HIRUNDINIDAE			
<i>Hirundo neoxena</i>	welcome swallow	x	x
MALURIDAE			
<i>Malurus cyaneus</i>	Superb fairy-wren	x	x
MELIPHAGIDAE			
<i>Lichmera indistincta</i>	brown honeyeater	x	x
<i>Manorina melanocephala</i>	noisy miner		x

<i>Meliphaga lewinii</i>	Lewin's honeyeater		x
MEROPIDAE			
<i>Merops ornatus</i>	rainbow bee-eater		x
MONARCHIDAE			
<i>Grallina cyanoleuca</i>	Australian magpie-lark	x	x
<i>Myiagra rubecula</i>	Leaden flycatcher	x	x
<i>Rhipidura fuliginosa</i>	grey fantail	x	x
MOTACILLIDAE			
<i>Anthus novaeseelandiae</i>	Richard's pipit	x	x
PACHYCEPHALIDAE			
<i>Colluricincla harmonica</i>	grey shrike-thrush	x	x
PARDALOTIDAE			
<i>Sericornis frontalis</i>	white-browed scrubwren	x	x
PLATALEIDAE			
<i>Threskiornis molucca</i>	Australian white ibis		x
<i>Threskiornis spinicollis</i>	straw-necked ibis	x	x
PLOCEIDAE			
<i>Neochmia temporalis</i>	red-browed finch		x
<i>Taeniopygia bichenovii</i>	Double-barred finch	x	x
ZOSTEROPIDAE			
<i>Zosterops lateralis</i>	silveryeye	x	x
REPTILES			
AGAMIDAE			
<i>Physignathus lesueurii</i>	eastern water dragon	x	x
<i>Pogona barbata</i>	bearded dragon		x
BOIDAE			
<i>Morelia spilota</i>	Carpet python		x

COLUBRIDAE			
<i>Boiga irregularis</i>	brown tree snake		x
<i>Dendrelaphis punctulata</i>	green tree snake		x
ELAPIDAE			
<i>Demansia psammophis</i>	yellow-faced whip snake		x
<i>Pseudonaja textiles</i>	eastern brown snake		x
SCINCIDAE			
<i>Lampropholis delicata</i>	eastern grass skink	x	x
AMPHIBIANS			
BUFONIDAE			
<i>Bufo marinus</i> *	cane toad		x
MYOBATRACHIDAE			
<i>Crinia signifera</i>	common eastern froglet		x
<i>Limnodynastes peronii</i>	brown-striped frog		x

APPENDIX N

- FLOODING IMPACT ASSESSMENT

Aquaculture Development - Cumulative Flood Impact Assessment - Tweed River Floodplain

Prepared For: David McPhee and Associates

Prepared By: WBM Oceanics Australia

Offices

*Brisbane
Denver
Karratha
Melbourne
Morwell
Newcastle
Perth
Sydney
Vancouver*

DOCUMENT CONTROL SHEET

WBM Oceanics Australia Brisbane Office: WBM Pty Ltd Level 11, 490 Upper Edward Street SPRING HILL QLD 4004 Australia PO Box 203 Spring Hill QLD 4004 Telephone (07) 3831 6744 Facsimile (07) 3832 3627 www.wbmpl.com.au ABN 54 010 830 421 002	Document:	R.B15320.001.01.doc
	Title:	Aquaculture Development - Cumulative Flood Impact Assessment - Tweed River Floodplain
	Project Manager:	Cathie Barton
	Author:	Emily Reid
	Client:	David McPhee and Associates
Client Contact:	David McPhee	
Client Reference:		
	Synopsis:	This study was undertaken in response to an information request from Tweed Shire Council to the client. It looks at flood impact of the proposed aquaculture development and cumulative development in the Tweed River Floodplain

REVISION/CHECKING HISTORY

REVISION NUMBER	DATE	CHECKED BY	ISSUED BY
0	06/09/04	CLB	ELV
1	14/09/04	CLB	ELV

DISTRIBUTION

DESTINATION	REVISION										
	0	1	2	3	4	5	6	7	8	9	10
David McPhee and Associates	2	4									
WBM File	2	1									
WBM Library	1	2									

CONTENTS

Contents	i
List of Figures	i
List of Tables	ii
1 INTRODUCTION	1-1
2 METHODOLOGY	2-1
3 RESULTS	3-1
3.1 Impact Scenario A	3-1
3.2 Impact Scenario B	3-1
3.3 Impact Scenario C	3-1
3.4 Impact Scenario D	3-2
4 CONCLUSIONS	4-1
APPENDIX A: AREAS OF FILL FOR PROPOSED AQUACULTURE DEVELOPMENT AND FUTURE CUMULATIVE DEVELOPMENT – AS PROVIDED IN CORRESPONDENCE FROM TSC 21/07/04	A-1

LIST OF FIGURES

Figure 1-1	Locality of Study Area on the Tweed River Floodplain	1-2
Figure 2-1	Fill area for Scenario 2 - Aquaculture Development	2-2
Figure 2-2	Fill areas for Scenario 3 - Cumulative Development	2-3
Figure 2-3	Fill area for Scenario 4 - Aquaculture Development and Cumulative Development	2-4
Figure 3-1	Impact Scenario A – 100 Year ARI Flood Event	3-3
Figure 3-2	Impact Scenario B – 100 Year ARI Flood Event	3-4
Figure 3-3	Impact Scenario C – 100 Year ARI Flood Event	3-5
Figure 3-4	Impact Scenario D – 100 Year ARI Flood Event	3-6

LIST OF TABLES

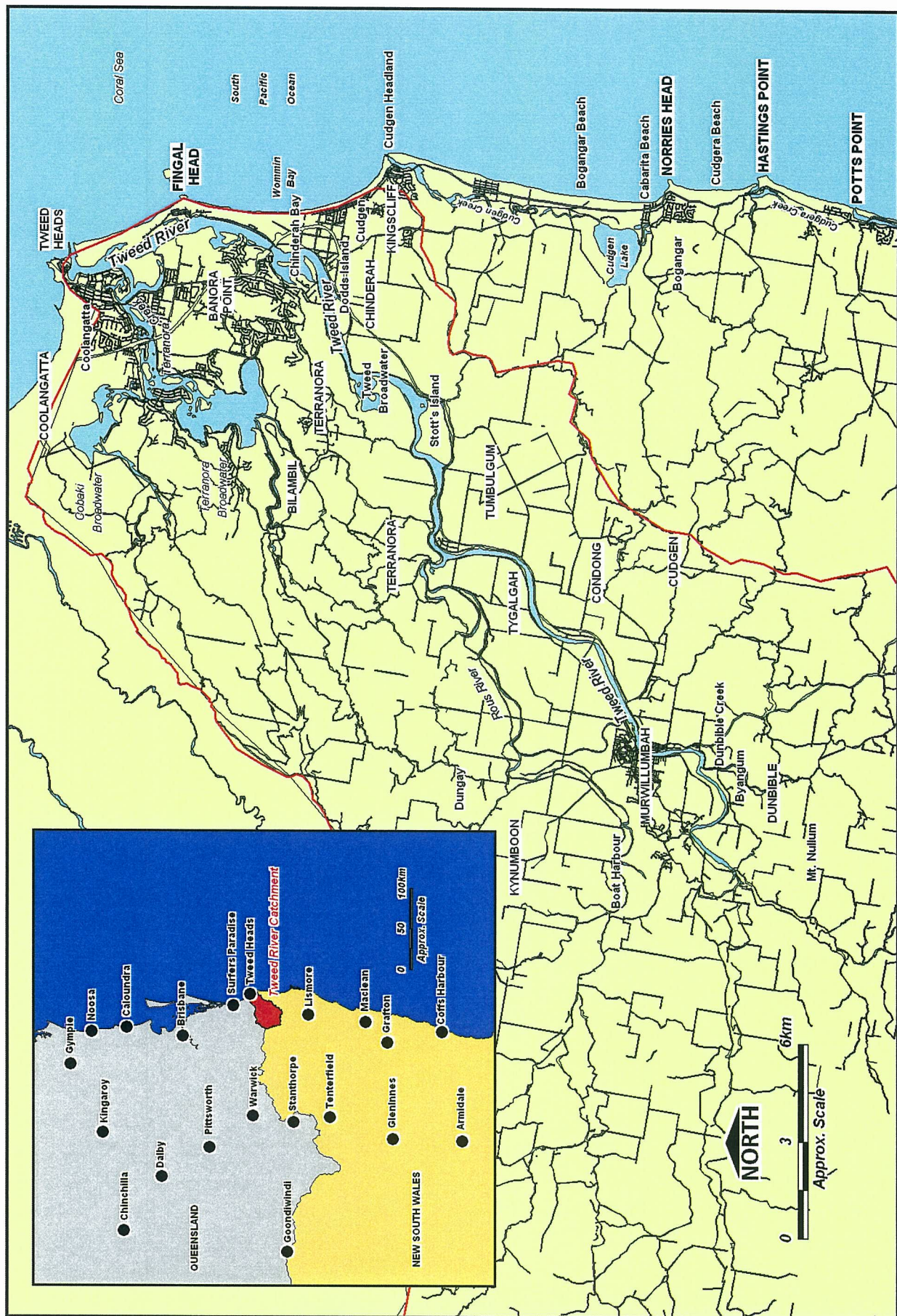
Table 2-1	Description of Scenarios	2-1
Table 2-2	Description of Impacts	2-1

1 INTRODUCTION

An Aquaculture development is proposed for 355 Cudgen Road, Cudgen on the Tweed River Floodplain. The development proposes bunding of a 45 hectare area to a height that will provide 100 year ARI flood immunity. A flood impact assessment is required to determine the impact of the development on peak flood levels and also the cumulative impact of the development when considered with future development elsewhere on the floodplain. Figure 1-1 shows the location and details of the Tweed River Floodplain. Figure 2-1 shows the location of the proposed Aquaculture development.

WBM Oceanics Australia is currently undertaking a Review of the Tweed River Flood Study. Hydraulic modelling is being undertaken with the dynamically linked 1D/2D model ESTRY/TUFLOW. Calibration is complete and the design phase of the flood study is in progress. The design phase of the study is typically completed and accepted prior to the model being used for other purposes. However, as timing is critical for this assessment, Council has requested that the impact assessment be completed prior to finalisation of the design phase. It is our opinion that this will not impact upon the ability of the model to accurately predict the impacts of the cumulative developments.

This report presents the methodology used for this assessment, and the findings.



Locality of Study Area on the
Tweed River Floodplain

Figure 1-1

2 METHODOLOGY

This section outlines the methodology used in assessing the aquaculture development. Details of the hydrologic and 1D/2D hydraulic model used for this assessment can be found in the Draft Tweed River Flood Study Report (WBM, 2004).

There are four scenarios considered in the flood impact assessment. These were provided in a letter dated 21 July 2004 from Tweed Shire Council to Australian Bay Lobster Producers Pty Ltd, and are provided below in Table 2-1. These Scenarios are assessed for a 100 year ARI (Average Occurance Interval) design event. A 100 year ARI or Q100 is a hypothetical flood or combination of floods which represent a flooding scenario likely to occur on average once every 100 years. Design floods are used for planning and floodplain management investigations.

Table 2-1 Description of Scenarios

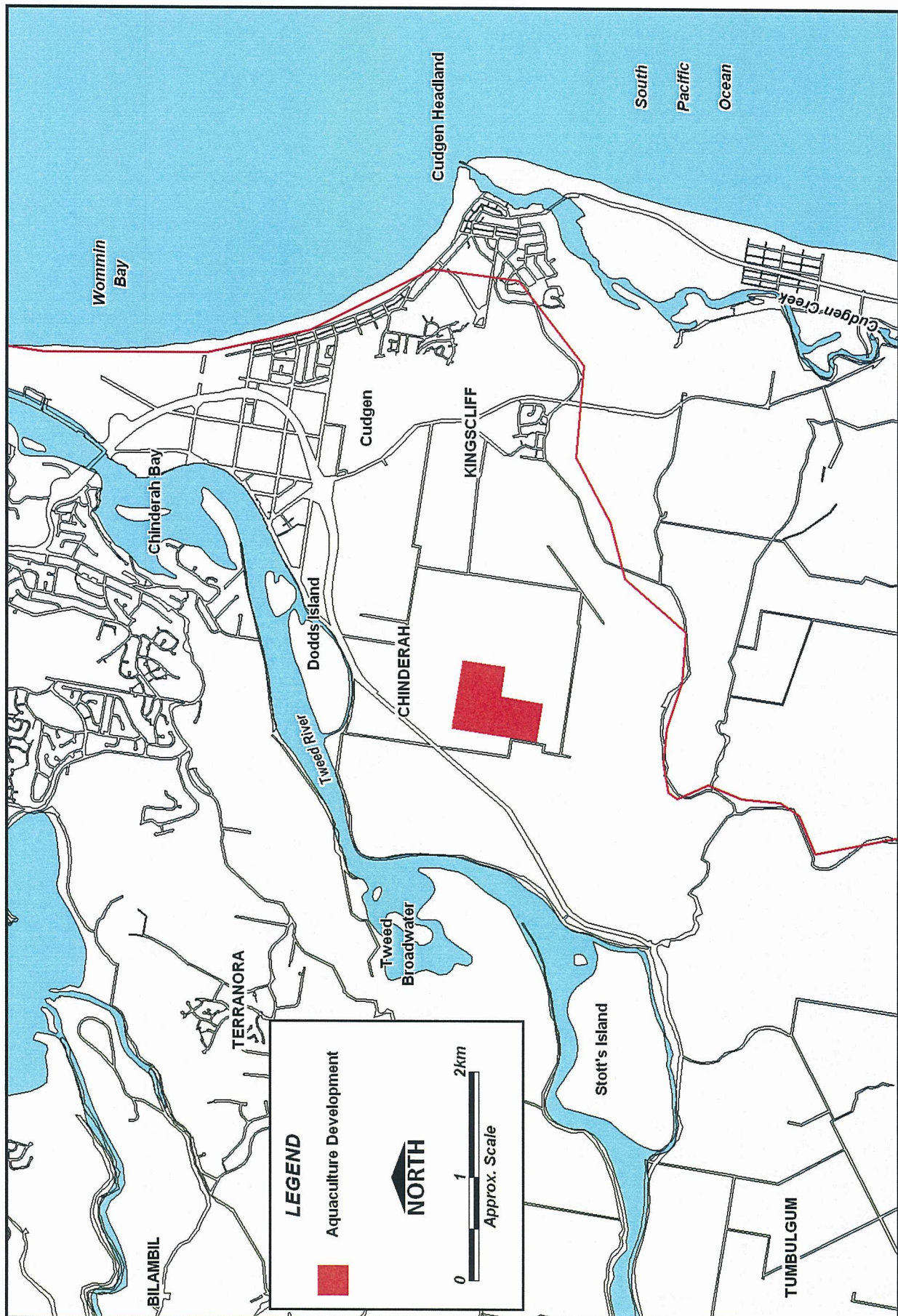
Scenario	Description
1	[Base Case] Existing Conditions
2	Base Case plus Aquaculture Development. The Aquaculture Development will be considered as being inaccessible to Q100 floodwaters within the perimeter of the bund.
3	[Cumulative Development Case] Future Development of areas as per plan attached to letter from Council dated 21 July 2004 and reproduced in Appendix A. These areas are considered as being filled to above Q100 flood level.
4	Cumulative Development Case plus Aquaculture Development.

These areas were incorporated in the 1D/2D model for the appropriate scenarios as fill above the 100 year ARI flood event. The areas filled for each scenario are shown in Figure 2-1 to Figure 2-3 for Scenarios 2, 3 and 4 respectively.

Impacts have been determined as described in Table 2-2. The impacts are presented as full colour figures with impact ranges coloured. Yellow indicates no change (to a 1cm tolerance). Shades of red indicate an increase and the green colours indicate a decrease. Pink is used to indicate the areas that were wet in Scenario 1 but are now dry (due to filling above the 100 year ARI level) and blue to indicate areas that were dry in Scenario 1 but have become wet. The floodplain section presented in the figures extends from Stotts Island to Barneys Point Bridge.

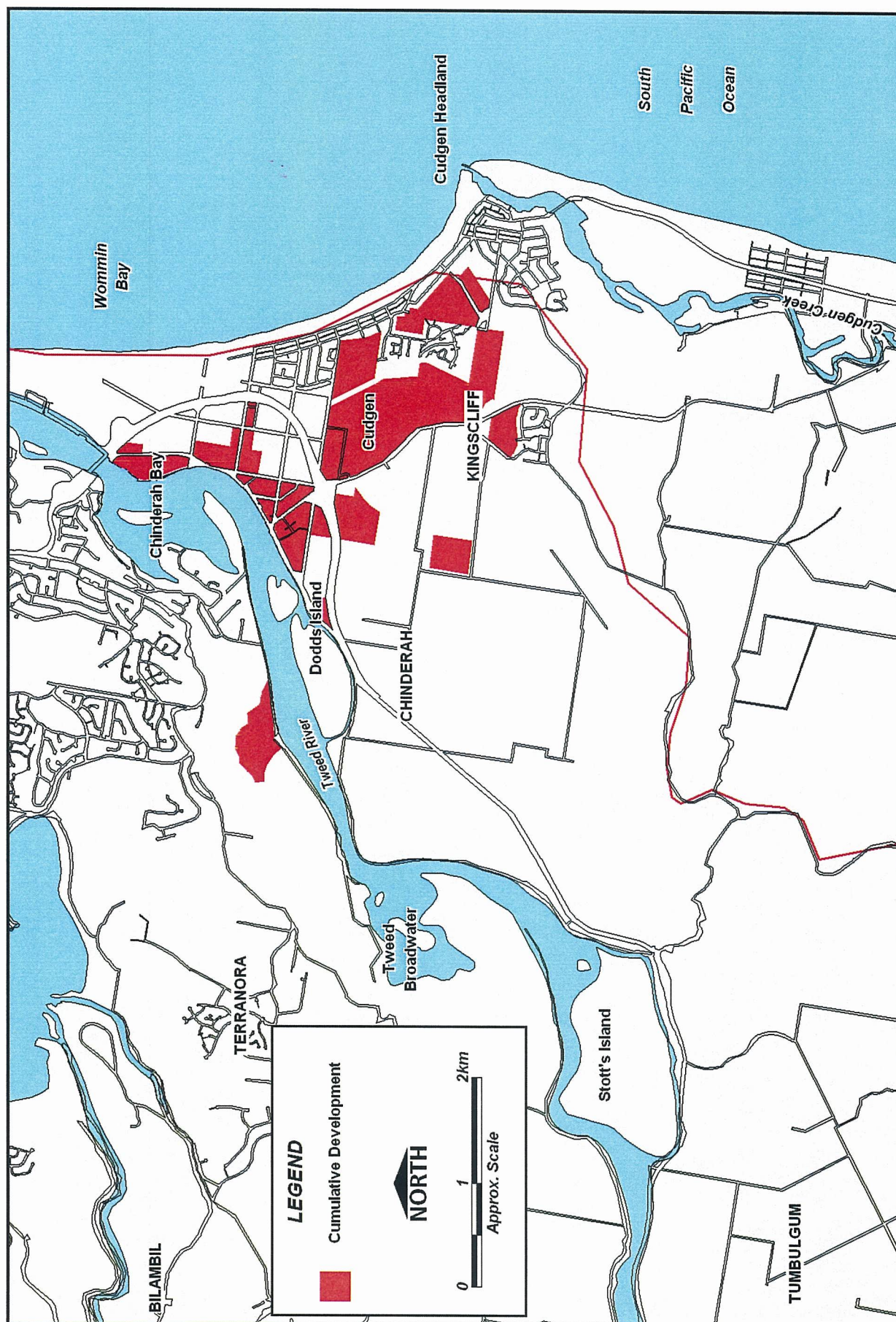
Table 2-2 Description of Impacts

Impact Scenario	Calculation	Description
A	Scenario 2 minus Scenario 1	Impact of Aquaculture Development with Existing Conditions
B	Scenario 3 minus Scenario 1	Impact of Other Cumulative Development
C	Scenario 4 minus Scenario 1	Impact of Cumulative Development plus Aquaculture
D	Scenario 4 minus Scenario 3	Impact of Aquaculture with Cumulative Development Conditions



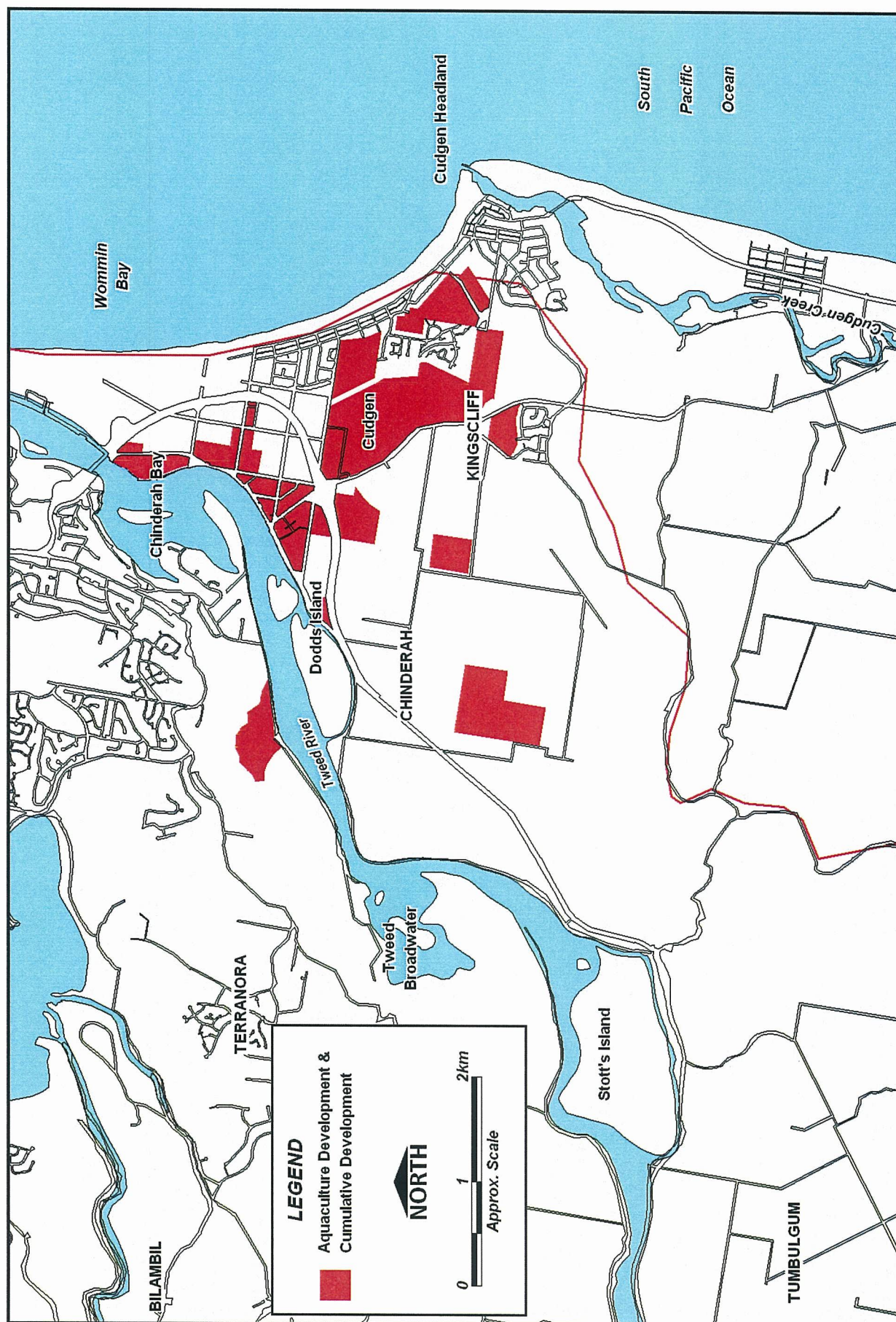
Fill Area for Scenario 2
Aquaculture Development

Figure 2-1



**Fill Areas for Scenario 3
Cumulative Development**

Figure 2-2



**Fill Areas for Scenario 4
Aquaculture & Cumulative Development**

Figure 2-3

3 RESULTS

Figures 3-1 to 3-4 show the results for Impact Scenarios A to D respectively. A description of the results is provided below.

3.1 Impact Scenario A

This scenario provides the impact of the Aquaculture development in isolation on 100 year ARI flood levels. As shown in Figure 3-1, increases of up to 7cm occur immediately south of the bunded Aquaculture development and corresponding decreases of approximately 2cm occur immediately north of the fill. This can be attributed to restriction of flow from the culverts and bridge under the Pacific Highway. There are increases on the western side of the highway up to 2cm. In the Base Case water overtops the highway to a depth of 10cm at the location of the proposed development. It is predicted that construction of the proposed bund will reduce this overtopping flow and thus produce a small increase on the western side of the highway. The impact on 100 year ARI peak flood levels to the east of the Aquaculture development site is negligible (less than 1cm). The majority of the site to the east is predicted to experience a decrease in flood levels of less than 1cm. A small portion of the site to the east (south-west corner) is predicted to experience a small increase in flood levels of less than 1cm.

3.2 Impact Scenario B

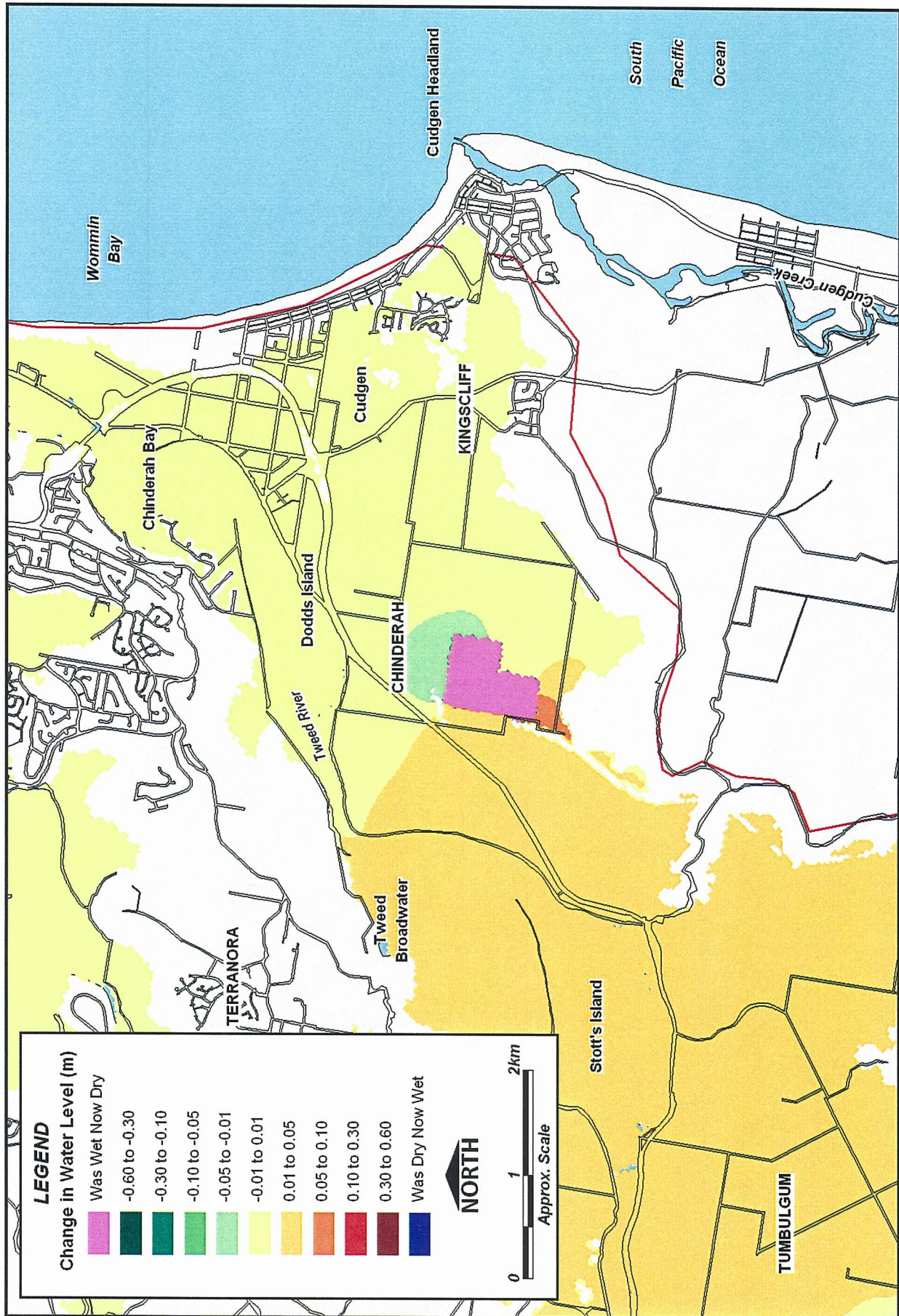
This scenario provides the impact of future cumulative development on 100 year ARI flood levels. The fill to the west of Chinderah Road is predicted to result in increases of up to 10cm in the vicinity of Chinderah Road and Crescent Street and to the west of Chinderah Road. These increases extend westward to the Pacific Highway. Impacts of up to 6cm extend from the Pacific Highway west to Stotts Island. Impacts of up to 3cm extend upstream of Stotts Island. Increases of up to 7cm extend downstream from Ozone Street to Barney's Point Bridge. Decreases of up to 55cm are predicted from Wommin Bay Road to north of Wommin Bay Crescent due to the severe restriction of the flow path from the river across Chinderah Bay Road by the proposed fill.

3.3 Impact Scenario C

This scenario provides the impact of both the Aquaculture development and the cumulative development on 100 year ARI flood levels. The fill west of Chinderah Road is predicted to result in increases of up to 10cm in the vicinity of Chinderah Road and Crescent Street and to the west of Chinderah Road. These increases extend westward to the Pacific Highway. Impacts of up to 8cm extend from the Pacific Highway west to Stotts Island. Impacts of up to 5cm extend upstream of Stotts Island. Increases of up to 7cm extend downstream from Ozone Street to Barney's Point Bridge. Decreases of up to 55cm are predicted from Wommin Bay Road to north of Wommin Bay Crescent. Increases of up to 14cm are predicted occur immediately south of the proposed Aquaculture development.

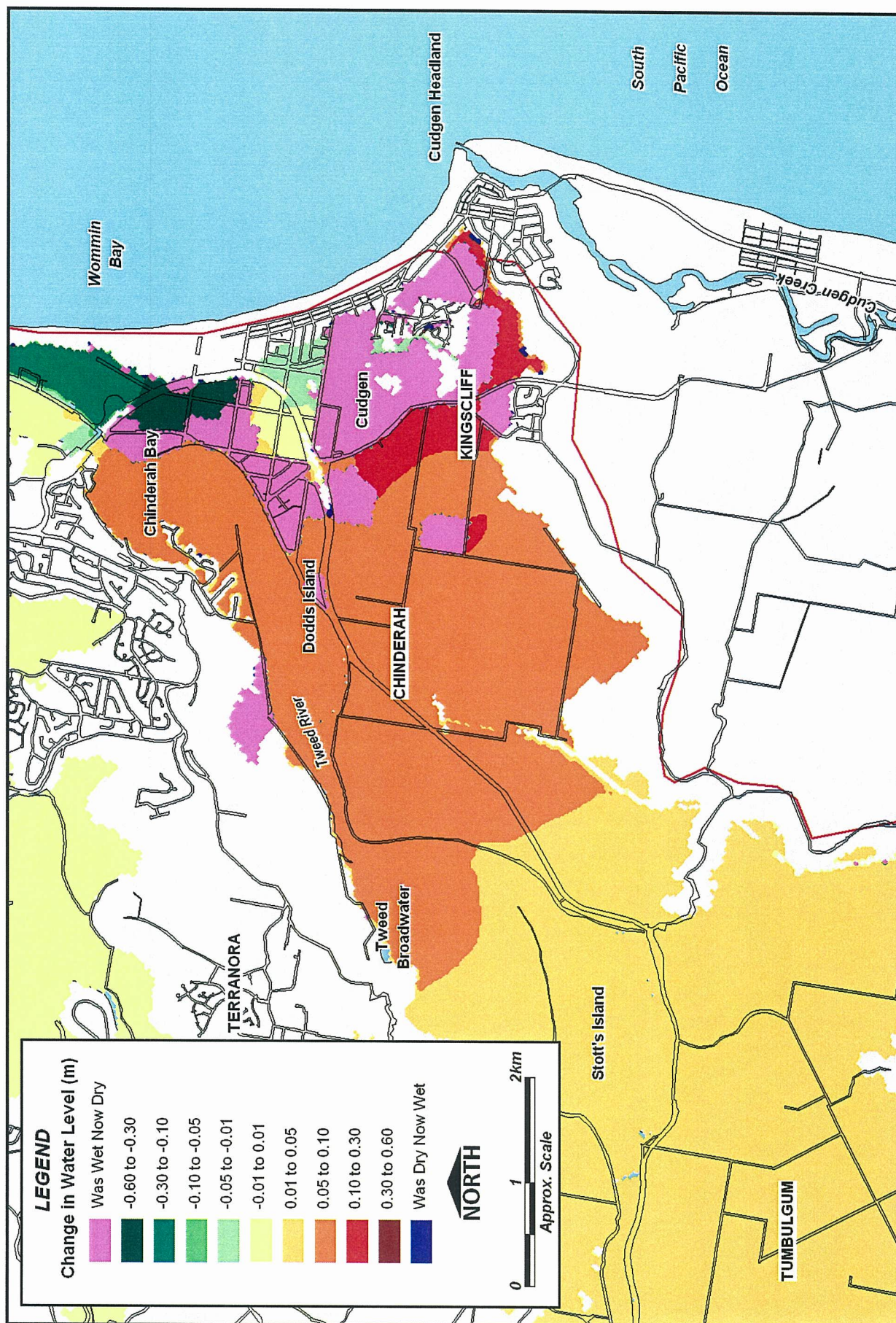
3.4 Impact Scenario D

This scenario provides the impact of the aquaculture development with cumulative development in place on 100 year ARI flood levels. Increases are predicted to the south of the proposed Aquaculture development to the magnitude of 6cm. A decrease is predicted up to 2cm to the north of the proposed bunding. These impacts are both a result of the constriction of flow through the structures under the Pacific Highway. Impacts to the west of the Pacific Highway are predicted in the magnitude of 2cm and span westward to Stotts Island where the increase is 1cm.



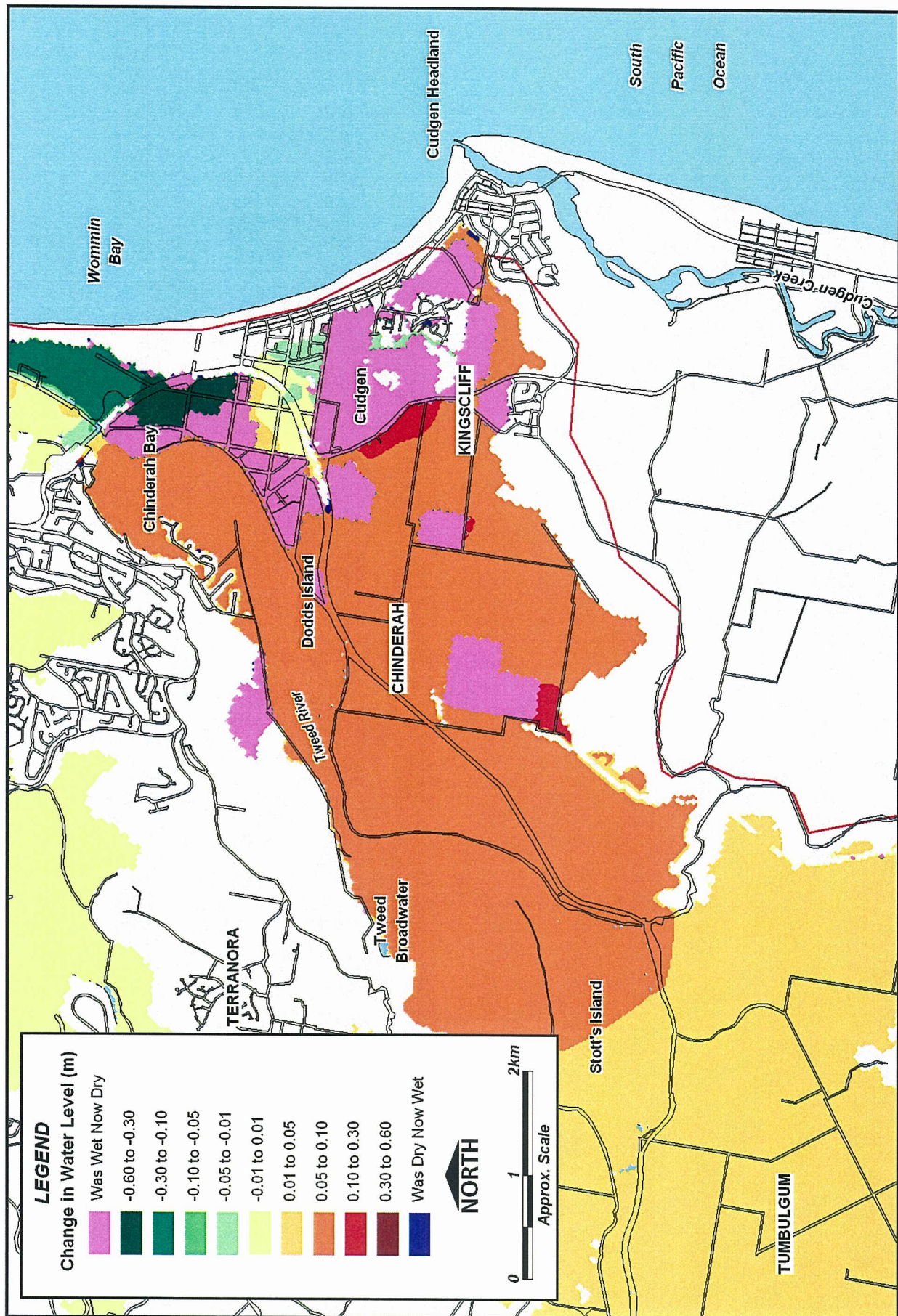
Impact Scenario A
100y ARI Flood Event

Figure 3-1



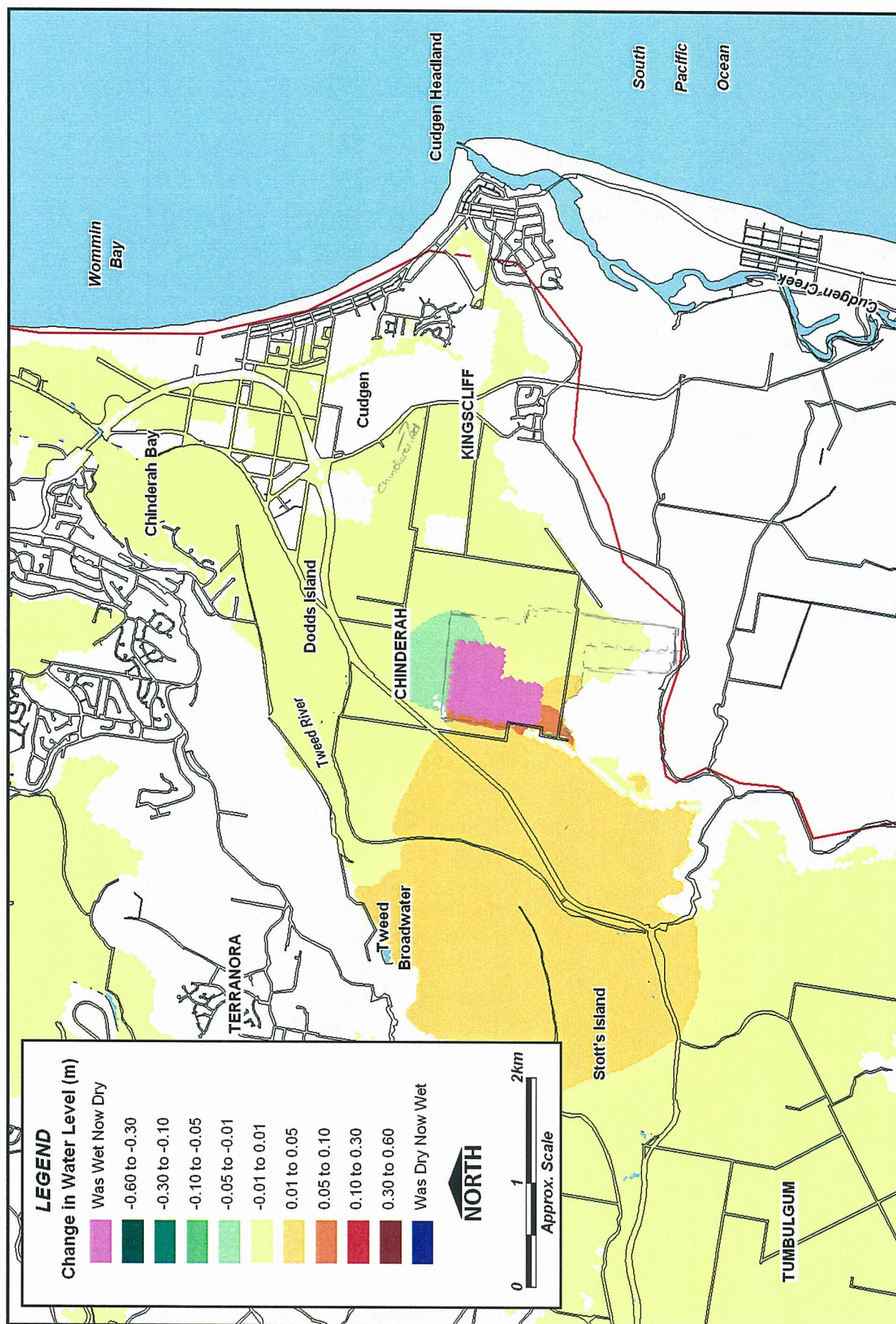
Impact Scenario B
100y ARI Flood Event

Figure 3-2



Impact Scenario C
100y ARI Flood Event

Figure 3-3



Impact Scenario D
100y ARI Flood Event

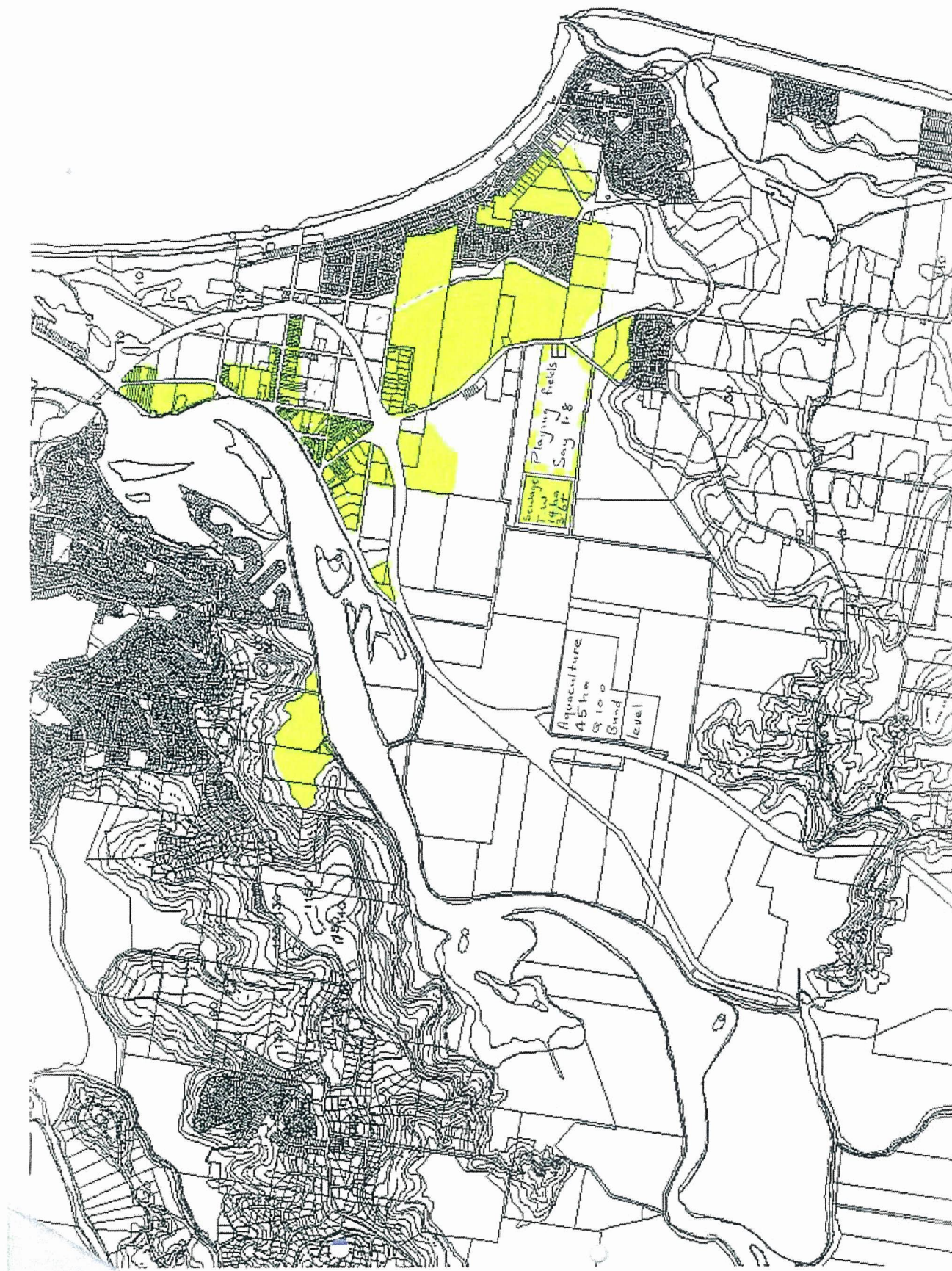
Figure 3-4

input aquaculture development contributes when all
contributes to a 5cm decrease north.
future developed in place - eg 5cm increase to west.

4 CONCLUSIONS

- Maximum predicted increase of the Aquaculture development in isolation (Scenario A) is 7cm to the south of the proposed bunding.
- Maximum predicted increase of other cumulative development (Scenario B) is 10cm westward of Chinderah Road.
- Maximum predicted increase of the aquaculture development in association with other cumulative development is 10cm west of Chinderah Rd.
- The impact on 100 year ARI peak flood levels to the east of the Aquaculture development site is negligible (less than 1cm). The majority of the site to the east is predicted to experience a decrease in flood levels of less than 1cm. A small portion of the site to the east (south-west corner) is predicted to experience a small increase in flood levels of less than 1cm.

**APPENDIX A: AREAS OF FILL FOR PROPOSED AQUACULTURE
DEVELOPMENT AND FUTURE CUMULATIVE
DEVELOPMENT – AS PROVIDED IN CORRESPONDENCE
FROM TSC 21/07/04**



APPENDIX O

- . PRELIMINARY ENVIRONMENT MANAGEMENT PLAN

APPENDIX O - PRELIMINARY ENVIRONMENTAL MANAGEMENT PLAN

Environmental Management

This section outlines the environmental management plan that will be prepared for the proposed ABLP development. The environmental objectives of the plan, and the measures to mitigate environmental impacts, the monitoring program and the audit and reporting program that will be included as part of the plan are described.

Introduction

The SEE provides an outline of an Environmental Management Plan (EMP) for the proposed ABLP aquaculture development based on the recommended safeguards identified in earlier sections. An EMP will be required to ensure all of the safeguards are put in place to protect the environment during the pre-construction, construction and operational phases of the project.

The EMP should address the following as a minimum:

- the environmental objectives of the proposed development;
- measures to mitigate environmental impacts;
- emergency contacts in the case of an environmental incident;
- monitoring program;
- audit and reporting system.

For all of the relevant aspects identified above the EMP should define the timing of required actions along with nomination of a person(s) whom has the responsibility for implementation, checking and verifying the required actions.

The final EMP should adopt the recommended actions contained in the outline EMP, along with any conditions of determination from Tweed Shire Council or other relevant authorities.

Outline EMP

An outline EMP, incorporating all of the recommended safeguards recommended in this SEE is presented as Table 1. This outline EMP should be used as the basis for the preparation of an EMP for the construction and operational phases of the proposal, either as a combined or separate EMP's.

Table 1.			
Environmental Management Parameters	Action	Timing	Responsibility
Water Quality	The effluent discharge shall be monitored as specified in the EPA Operational Licence conditions and as outlined in Section 5.2.3.	Operation	ABLP
	The performance of the system shall be assessed on a regular basis by monitoring of wastewater treatment plant and equipment in the facility.	Operation	ABLP
Hydrological Issues	ABLP facility designed to be above the 1 in 100 year ARI flood level.	Preconstruction	Designer
	All external embankment surfaces shall be	Construction	Construction

	protected against scour.		Contractor
Groundwater	All in-ground structures shall be adequately sealed by HDPE liners, compaction or other means suitable to ensure groundwater contamination by seepage does not occur.	Construction	Construction Contractor
Terrestrial Flora	Mature individual trees close on the western boundary of the site should be retained where possible for their habitat potential	Construction	Construction Contractor
	Planting of native shrubs and trees endemic to the area (as approved by Council) should be undertaken on the site to reintroduce biodiversity to the region.	Construction	Construction Contractor
	A comprehensive plan of management to eradicate identified weed species shall be implemented, and the material disposed in an approved manner.	Operation	ABLP
Terrestrial Fauna	Planting of native shrubs and trees on the site should be undertaken to create habitat for native fauna.	Construction	Construction Contractor
Soils	Conduct geotechnical studies to identify existing levels of ASS and PASS on site.	Preconstruction	Construction Contractor
	Develop an Acid Sulfate Soils Management Plan in accordance with "Acid Sulfate Soil Manual" (ASSMAC, 1998) to the satisfaction of the NSW EPA.	Preconstruction	Construction Contractor
	An erosion and sedimentation control plan (ESCP), be prepared and implemented prior to the commencement of construction to: Divert overland flow away from exposed construction areas; Progressively revegetate or stabilise the land as the works are completed; Use defined haul roads and access tracks; recycled crushed concrete to protect same Use mulch to protect exposed soil surface and facilitate grass growth; Use best practice erosion and sediment control techniques	Preconstruction	Construction Contractor
	The ESCP shall include site plans showing the locations and types of all erosion protection measures.	Preconstruction	Construction Contractor
	All imported fill material shall be sourced from a reputable location and verified as being clean prior to delivery to the site.	Preconstruction	Construction Contractor
	All stockpiled fill material shall be placed well away from drainage lines and adequately protected against erosion.	Construction	Construction Contractor
	Disturbed areas shall be minimised through sound construction planning.	Construction	Construction Contractor
	All disturbed areas shall be stabilised as soon as construction has finished in the immediate vicinity	Construction	Construction Contractor
	All erosion control structures shall be maintained until the area is stabilised	Construction	Construction Contractor
	Disturbed areas should be stabilised using appropriate native grasses and sterile cover crops (if required);	Construction	Construction Contractor
	All unnecessary works should cease during heavy rainfall events in order to minimise erosion and sedimentation.	Construction	Construction Contractor

	All erosion control structures should be inspected and replaced if necessary on a regular basis, and within 24 hours of a rainfall event that results in runoff.	Construction	Construction Contractor
	Excavated existing soils should not be re-used on the surface if possible, but rather should be buried beneath clean imported fill	Construction	Construction Contractor
	During excavation if there is any evidence to suggest that the excavated material is contaminated it should be confirmed by laboratory testing prior to re-use of the fill material	Construction	Construction Contractor
	If the presence of contaminated fill is confirmed it should then be managed in accordance with the appropriate guidelines and procedures.	Construction	Construction Contractor
Visual Amenity	Strategic planting of native shrubs and trees on the site should be undertaken to minimise visual impact.	Construction	Construction Contractor
Non-Indigenous Heritage	Should any items or relics of European heritage significance be discovered during the works then all works in the immediate vicinity must halt and Council heritage advisers, and if necessary, NSW Heritage Council consulted for further advice.	Construction	Construction Contractor & ABLP
Indigenous Heritage	To ensure that sites or relics of Aboriginal heritage significance are not impacted by the proposed works, TBLALC shall be consulted prior to the commencement of construction activities, and invited to be present during excavation activities in undisturbed areas.	Pre - construction	Construction Contractor & ABLP
	In the event that construction works uncover any sites or relics of Aboriginal heritage significance all works in the vicinity must cease immediately and Council's heritage adviser, TBLALC and NPWS contacted as required. If human remains are uncovered during construction then NSW Police should also be contacted in addition to the above until the source of the remains are identified.	Construction	Construction Contractor & ABLP
Noise	Submersible pumps shall be used for growout systems recirculation if economically viable.	Pre - construction	Designer
	Construction activities shall be planned in advance to ensure minimisation of length of activities associated with noise generation, and avoidance of undertaking high noise activities at sensitive times.	Pre - construction	Construction Contractor
	Quiet plant and equipment shall be selected and used where practical and cost effective.	Pre - construction	Construction Contractor
	A Traffic Management Plan shall be prepared that selects a designated route for all heavy vehicle movements that minimises the need for travel on quiet residential and rural roads.	Pre - construction	Construction Contractor
	A comprehensive community consultation program should be implemented in regards to noise that: Advises the community of the type, nature and length of construction activities prior to the commencement of construction, and at	Pre - construction & Construction	Construction Contractor

	regular intervals; and Provides the community with a contact phone number for a person with the authority to take action to address the complaint if required.		
	All plant and equipment shall comply with, and be operated in accordance with manufacturers specifications and relevant standards, including residential grade mufflers where available.	Construction	Construction Contractor
	Noise mufflers and shrouding / enclosures for high noise generating equipment shall be provided if required.	Construction	Construction Contractor
	All activities shall comply with Australian Standard AS 2436.	Construction	Construction Contractor
	All construction activities, including movements to and from the site, shall only be undertaken during the EPA approved construction hours, which are: Monday to Friday - 7:00am to 6:00pm; Saturdays - 8:00am to 5:00pm; and Sundays and Public Holidays - no works.	Construction	Construction Contractor
Air Quality	The extent of exposed disturbed areas shall be minimised by sound construction planning.	Construction	Construction Contractor
	During construction all plant and equipment shall comply with Section 129 of the Protection of the Environment Operations Act 1997.	Construction	Construction Contractor
	Disturbed surfaces shall be watered as necessary to minimise dust generation during dry and windy conditions.	Construction	Construction Contractor
	Works shall cease during periods of high winds when dust control by watering is ineffective	Construction	Construction Contractor
	All plant and equipment used on site shall have properly fitted and maintained exhaust systems in accordance with the manufacturer's specifications and relevant standards.	Construction	Construction Contractor
	All waste storage facilities should be maintained to ensure that they are effective in capturing odours generated by the waste.	Operation	ABLP
Traffic	Designated heavy vehicle routes that avoid the main town centre and quiet residential streets shall be selected prior to the commencement of construction and enforced	Preconstruction & Construction	Construction Contractor
	All vehicles, both light and heavy, movements to and from the site shall be restricted to the EPA approved construction hours.	Construction	Construction Contractor
Services	Service Providers should be consulted prior to the commencement of construction to discuss their needs and locate all existing services.	Preconstruction	Construction Contractor
	As part of an overall Incident Management Plan for the project that power failure, both planned and accidental, be addressed	Preconstruction	Construction Contractor & ABLP
Resource and Waste Management	Waste minimisation goals shall be included in all contracts.	Preconstruction	ABLP

	All re-useable or recyclable packaging shall be returned to the supplier where possible.	Construction	Construction Contractor
	Timber and concrete waste streams shall be re-used on-site where possible.	Construction	Construction Contractor
	Suitable bins and toilet facilities shall be provided.	Construction and Operation	Construction Contractor & ABLP
Chemicals Management	All chemicals storage and handling areas shall be designed in accordance with the relevant Australian Standards and OH&S requirements.	Preconstruction	Designer
	All chemicals used during construction and operations shall be managed and handled with due regard to the environment, and shall not be placed in a manner so as to threaten the environment.	Construction and Operation	Construction Contractor & ABLP
Disease	Wild caught broodstock will be quarantined prior to entering the production facility	Operation	ABLP
	In the event of a notifiable disease occurrence, NSW fisheries will be informed, infected stock will be euthanased and disposed of into an approved waste disposal facility	Operation	ABLP
	In the event of a mass mortality, stock will be disposed into an approved waste facility and production systems cleaned and disinfected	Operation	ABLP
	Stock shall be monitored for health status and addressed as part of the project Incident Management Plan	Operation	ABLP
Operational	An Operational EMP shall be prepared to address all environmental management aspects associated with the operation of the Bay Lobster aquaculture facility.	Operation	ABLP
	Plant and equipment maintenance shall be undertaken on a regular basis in accordance with industry standards.	Operation	ABLP
	An Incident Management Plan shall be prepared to address emergency situations.	Operation	ABLP
	All staff shall be appropriately trained for the duties they are performing.	Operation	ABLP

Monitoring Requirements and Reporting

Water quality of the treated seawater discharged from the ABLP facility will continue to be monitored. As a minimum pH, salinity, total P, total N, ammonia, suspended solids and dissolved oxygen will be monitored on a daily basis.

ABLP treated seawater discharge will be combined with treated wastewater which is presently piped from the existing Kingscliff WWTP to the Tweed River outfall at Jenner's Corner. TSC will monitor their treated wastewater quality and sample the Tweed River water quality to monitor long term changes in physical characteristics and nutrient levels. ABLP's sampling will quantify the total nutrient input from treated seawater to the Tweed River and will be used to benchmark a process of continual improvement in husbandry and water treatment technologies.

In addition to this environmental monitoring, as part of its normal operations, ABLP will conduct detailed process monitoring of key recirculation units within the proposed plant to ensure they continue to operate effectively.

Clear procedures shall be developed that will be undertaken in the event that any of the monitoring indicates non-compliance. This will include internal and external reporting requirements.

The implementation of a comprehensive and effective monitoring program will ensure that the commitments and predictions made in the SEE can be verified and the ecological sustainability of the project confirmed.

APPENDIX P

- PRELIMINARY PLANNING INVESTIGATION

**PRELIMINARY PLANNING INVESTIGATION REPORT FOR A
PROPOSED AQUACULTURE DEVELOPMENT AT
LOTS 706, 708, 709, 710 DP 1000580; LOT 1 DP267742; & LOT 1 DP578962
PARISH OF CUDGEN, 355 CUDGEN ROAD, CUDGEN, NSW**

1.0 INTRODUCTION

This report is in relation to a proposed aquaculture development at Lots 706,708,709,710 DP 1000580; Lot 1 DP267742; and Lot 1 DP578962 Parish of Cudgen, 355 Cudgen Road, Cudgen, NSW.

2.0 SITE AND LOCALITY

The subject land is located within the Tweed Shire Council area at Cudgen that is approximately 10 km south of Tweed Heads and the NSW/QLD border.

Figures 1 and 2 show the site in its regional and local contexts respectively.

The site is described as Lots 706,708,709,710 DP 1000580; Lot 1 DP267742; and Lot 1 DP578962 and has a total area of approximately 148.5ha. W. Evans currently owns the property.

The land has an approximate 810 m frontage to the new Pacific Highway on the western side of the property with an entrance in the northwestern corner off the Murwillumbah overpass. The Tweed Shire Council has proposed and is currently negotiating with landowners to extend a road running east from the overpass to run along the northern boundary of the property and continue through to Chinderah Road. There is also an entrance off Cudgen Road at the southern side of the property.

Adjoining land uses to the north, west and east include sugar cane cultivation, grazing, Melaleuca production and tourism. A substantial sand extraction operation is located on an adjoining property to the east of the subject land.

3.0 DEVELOPMENT PROPOSAL

Australian Bay Lobster Producers Pty Ltd (ABLP) is the proponent for the proposed aquaculture development on the subject site.

The development would involve the construction of facilities for the breeding and growing of "Bay Lobster" *Thenus spp.*, a lobster species commonly known as Moreton Bay Bugs. It involves an investment in excess of \$40,000,000, with approximately 70 jobs and an export value in excess of AUD\$50,000,000 p.a. in Stage 1 growing through to greater than 200 jobs and \$150,000,000 p.a. in export value in Stage 3.

Key location criteria for the development proposal include:

- ♦ Access to high quality sea water – via the Road reserves;
- ♦ A site within 1.5 hrs from Brisbane Airport;
- ♦ Ready access to labor and services – Tweed catchment;
- ♦ Ready access to arterial transport routes – with the Pacific Highway and Oak Avenue.

Site criteria:

Sufficient land area for project expansion;
Minimal disturbance of existing vegetation required;
The property is above AHD 1 m.

4.0 STATUTORY PLANNING FRAMEWORK

4.1 Consent Authority

On the 3 September 1999 the Minister for Urban Affairs and Planning made a declaration pursuant to section 76A(7) of the Environmental Planning and Assessment Act, 1979, as amended, declaring an "aquaculture industry" to be state significant development if, in the opinion of the consent authority;

- ♦ The project has been identified as being of state or regional significance in a strategic plan adopted by the Director General; or
- ♦ The project will employ more than 20 people.

On the basis that the project will employ more than 20 people the proposal is caught by the declaration. The Minister for Infrastructure, Planning and Natural Resources is therefore the consent authority pursuant to sections 4 and 76A of the Act. Any Development Application would therefore need to be lodged and processed by the Department of Infrastructure, Planning and Natural Resources.

4.2 Species Impact Statement

Section 78A(8)(b) of the Act provides that a Development Application must be accompanied by;

"If the application is in respect of development on land that is, or is part of, critical habitat or is likely to significantly affect threatened species, populations or ecological communities, or their habitats – a Species Impact Statement prepared in accordance with division 2 of part 6 of the Threatened Species Conservation Act, 1995."

Further, section 79B(3) of the Act provides that;

"Development Consent cannot be granted for;

- a) development on land that is, or is part of, critical habitat, or*
- b) development which is likely to significantly affect a threatened species, population, or ecological community or its habitat,*

without the concurrence of the Director General of the National Parks and Wildlife Service or, if the Minister is the consent authority, unless the Minister has consulted with the Minister administering the Threatened Species Conservation Act 1995."

For the purposes of administering section 78A, sections 5A and 5C of the Act identify 8 factors which must be taken into account in deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities or their habitats (including fish and marine vegetation).

Clearly, in the absence of an 8 Part Test Report prepared by a qualified ecologist, it is not possible to reach a definitive conclusion in relation to whether or not a Species Impact Statement will be required. However, based on the fact that the site is highly disturbed and has been used for sugar cane production for many years we are of the view that no Species Impact Statement is required.

4.3 STATE ENVIRONMENTAL PLANNING POLICY NO. 62 – SUSTAINABLE AQUACULTURE

State Environmental Planning Policy No. 62 is the principal environmental planning instrument controlling development for the purposes of aquaculture in NSW. The Policy prevails in the event of any inconsistency with another environmental planning instrument. The Policy applies to the Shire of Tweed. Clause 7 of the policy provides that;

“A person may carry out tank based aquaculture with development consent if in the opinion of the consent authority it complies with the site location and operational requirements set out in Schedule 1 for the development (the minimum performance criteria).”

The minimum performance criteria for permissible development contained in Schedule 1 are reproduced in attached **Table 1** together with comments thereon.

Clause 10 of the policy requires the consent authority, in determining a development application, to take into account relevant provisions of any aquaculture industry development plan. The North Coast Sustainable Aquaculture Strategy (August 2000) includes an aquaculture industry development plan comprising sections on:

- Business planning
- Species selection
- Site selection
- Planning and design
- Operating the farm

Site selection and planning and design considerations are particularly relevant to this investigation. The principle issues that arise from these considerations include:

- The need for a potable water supply for processing and employees.
Water supply is proposed to be obtained from roof water runoff, treated and stored on site to provide an adequate supply.

-
- Sites that are flood prone should be avoided. If unavoidable, then a detailed risk assessment should be undertaken.

- Native Title Issues

The NSW North Coast Sustainable Aquaculture Strategy indicates, “most vacant crown land on the north coast is under one claim or more”.

A license from Tweed Shire Council and the Department of Lands for a pipeline over road reserves to the beach would avoid the need to resolve any potential native title claims.

- Heritage Issues

No listings on NSW Heritage Office, LEP or REP database. NPWS database not yet checked.

- Amenity Issues

The Strategy identifies a preferred location where no residences are within 400 m of ponds or pumps or 200m of tanks. There are no apparent dwellings within these buffer distances.

- Agricultural Land Issues

The preferred location is where no pesticide spraying occurs within 1 km of the site. There are a number of cane fields to the north and west of the site where spraying of herbicides and pesticides may occur within 1 km of the subject land. Advice from local growers and the only local aerial spraying contractor confirms that pesticide spraying is not undertaken within 1 km of the site.

- Native Vegetation

Section 2.2 of the Planning and Design Guidelines provides for a preferred design which does not disturb native vegetation or habitat. The Tweed Vegetation Management Plan (1999) indicates that the majority of the site is substantially cleared of vegetation.

- Coastal Crown Lands and Road Reserve

This has implications for any development within the crown road reserve, however it is considered that suitable underground pipelines could be provided such that minimal disturbance occurs and there is no obstruction to public access along the road reserve.

- Clauses 12 and 13

These clauses provide that a “*project profile analysis*” in relation to the site location and operational attributes of the development is to be completed to determine the level of risk.

The project profile analysis is then used to determine the category of development as follows;

- a) Class 1 – Non designated development – Low level risk;

- b) Class 2 – Non designated development – Medium level risk;
- c) Class 3 – Designated development.

The relevant class of development is determined as follows;

- a) Class 1 – If all the risk levels in relation to each attribute are level 1,
- b) Class 2 – If all the risk levels in relation to each attribute are level 2 or levels 1 and 2,
- c) Class 3 – If any risk level in relation to an attribute is level 3.

The NSW North Coast Sustainable Aquaculture Strategy (August 2000) contains criteria to be considered in a project profile analysis. The relevant criteria are addressed in the following tables based on the limited information currently available.

TIER 1 – SITE EVALUATION FOR TANKS

SITE EVALUATION CRITERIA FOR TANKS	TIER 1 LEVEL OF ASSESSMENT FOR TANKS		
	LEVEL 1	LEVEL 2	LEVEL 3
1. Water Supply Based on DLWC information			
(a) Saline – if dependent on estuarine – tidal amplitude	Ocean intake, therefore tidal amplitude >> than 300mm		
(b) Fresh – water availability	Not applicable – no fresh water aquaculture		
2. Acid Sulfate Soils			
If site <2m AHD; ASS Risk profile based on ASS Risk maps	Ap2	Wa2	
3. Heritage Issues			
(a) Heritage sites based on LEP or REP maps and State Heritage Inventory	No listed sites under Tweed Local Environmental Plan or North Coast Regional Environmental Plan 1988.		
(b) Aboriginal Heritage based on NPWS Aboriginal Sites Register	Highly disturbed site, NPWS register to be searched.		
4. Conservation Issues			
(a) NPWS protected areas, RAMSAR Wetlands, Critical habitat, Aquatic Reserves and Marine Parks (except “General Zone”)	Not located in or adjacent these areas and no potential to disturb these areas		

SITE EVALUATION CRITERIA FOR TANKS	TIER 1 LEVEL OF ASSESSMENT FOR TANKS		
	LEVEL 1	LEVEL 2	LEVEL 3
(b) SEPP 14, SEPP 26, Marine Parks ("General Zone") World Heritage Areas	Not located in or adjacent these areas and no potential to disturb these areas		
5. Stock Species			
Note: Species that are inconsistent with translocation policy are not permissible	<i>Thenus spp.</i> is indigenous to NSW and is consistent with translocation policy		
6. Site Accessibility			
Vehicle and electricity accessible based on LEP maps and power suppliers information	Existing access and services or access and services can be readily provided		

TIER 2 – SITE EVALUATION FOR TANKS

SITE EVALUATION CRITERIA FOR TANKS	TIER 2 LEVEL OF ASSESSMENT FOR TANKS		
	LEVEL 1	LEVEL 2	LEVEL 3
7. Water Supply			
(a) Water quality risks from nearby land uses	Not applicable		
(b) Potable water for processing or other purposes	Project will utilise roof shed rain water from storage pond treated to potable quality		
8. Water Supply Access From Rivers or Estuaries			
(a) Estuarine – pump station site		Project requires intake pipelines (into ocean beach) and pump station	
(b) Estuarine – estuary circulation	N/A		
(c) Freshwater – pump station site	N/A		
(d) Freshwater – Environmental flows	N/A		
9. Soils			
For freshwater tank culture: Area to irrigate for agriculture, plantation,	Not applicable – Saline water – marine culture with no land disposal of		

Darryl Anderson Consulting Pty Ltd

A.C.N. 093 157 165

Town Planning & Development Consultants

SITE EVALUATION CRITERIA FOR TANKS	TIER 2 LEVEL OF ASSESSMENT FOR TANKS		
	LEVEL 1	LEVEL 2	LEVEL 3
horticulture or landscaping if:	waste water		
(a) no trade waste agreement for disposal of discharge water; or	N/A		
(b) no non-irrigation reuse scheme, e.g. hydroponics	N/A		
10. Hydrology Issues			
(a) Catchment Stormwater Drainage	Project will have provisions to manage across site flows not likely to affect surrounding area		
(b) Flood liability for non-indigenous species to the catchment (except high security species, e.g. barramundi which must be located >PMF	N/A <i>Thenus spp.</i> are indigenous		
(c) For fresh water tanks: Drinking water supply protection	Project is not located in a drinking water catchment		
11. Ecology			
(a) Type of existing vegetation on the actual development site	Predominately cleared, some cultivation		
(b) Likely disturbance of native vegetation communities		Pipeline access may require disturbance of native vegetation if it is present	
(c) Likely occurrence of threatened species, populations or ecological communities or their habitats	No threatened species, populations or ecological communities or their habitats known or likely to occur – 8 Part Test Report not required		
(d) Likely impact on aquatic habitats and mangroves	No likely disturbance or impact		
12. Aboriginal Heritage			
(a) Location of Aboriginal Sites	Because of the characteristics of the		

SITE EVALUATION CRITERIA FOR TANKS	TIER 2 LEVEL OF ASSESSMENT FOR TANKS		
	LEVEL 1	LEVEL 2	LEVEL 3
	land no aboriginal sites are likely to occur but an archaeological survey may be required.		
(b) Consultation with Aboriginal community (Call NPWS for appropriate contacts)	The local aboriginal community would need to be consulted.		
(c) Likely impact on Aboriginal heritage	No impact on Aboriginal sites or places of significance to Aboriginal community is likely. The local aboriginal community would need to be consulted. An archaeological survey may also be required.		
13 Adjacent Land Use To Tank Culture			
(a) Potential for Conflict with Neighbors	Neighboring land zoned for compatible purposes e.g. agriculture or industrial development		
(b) Potential Visual Impact	Project housed in building < 7.2 metres in height	Site overlooked by dwellings on Cudgen ridgeline & visible from Motorway overpass	
(c) Proximity to Residences	In rural zone with no residences within 200 m of buildings or pumps.		

TIER 3 – OPERATIONAL EVALUATION CRITERIA FOR TANKS

OPERATIONAL CRITERIA FOR TANK CULTURE	TIER 3 LEVEL OF ASSESSMENT		
	LEVEL 1	LEVEL 2	LEVEL 3
14. Health Management			
(a) Arrangements for the timely identification and treatment of diseases	Project has trained on-site staff (microbiologists, crustacean physiologist) with appropriate facilities		
(b) Clean in Place (CIP)	Project designed with biologically separate systems which can be independently disinfected and dried		
15. Food and Feeding Management			
(a) Feed storage to prevent odour emissions or vermin problems	Feed for project is in frozen storage in enclosed building		
(b) Feeding system	In this project leftover feed is removed from raceways and the quantity leftover is used to adjust the amount fed at the next scheduled feed		
16. Water Monitoring			
(a) Capacity Level (1) DO, temperature & pH	All raceway systems are sampled at least every day for temperature, DO, pH, salinity		
(b) Capacity Level (2) Water analysis eg N,P, Alkalinity/acidity, NFR, BOD	In house facilities for water sampling of raceway systems and wastewater system for nutrients, NFR, BOD etc.		
17. Tank and Raceway Water Management			
(a) Water Supply	Project proposes an ocean intake with twin pipelines and pumping station rated at 300% of maximum daily flow plus seven day storage reserve		
(b) Water quality	Recycle system with		

Darryl Anderson Consulting Pty Ltd

A.C.N. 093 157 165

Town Planning & Development Consultants

OPERATIONAL CRITERIA FOR TANK CULTURE	TIER 3 LEVEL OF ASSESSMENT		
	LEVEL 1	LEVEL 2	LEVEL 3
management and recycle system	mechanical and biofiltration and/or chemical treatment, or better		
(c) Storage capacity of recycling ponds	Project is based on recirculation technology. There are no recycling ponds as in the prawn farming context but the holding pond prior to discharge has a volume >> 2 times the volume of the largest raceway		
18. Tank and raceway discharge water management (a) Saline tank and raceway culture (b) Water quality management and recycle system	Recycle system with mechanical and biofiltration and chemical treatment, or better	Mechanical filtering <1000 microns	
19. Organic Waste Management (eg dead fish, processing waste and other waste)			
(a) Temporary storage of organic waste prior to disposal (eg. dead fish, processing waste and other putrescible waste)	Project proposes daily disposal of organic waste		
(b) Disposal of organic waste	Disposal at an approved off-site recycling or landfill facility		
20. Planning and Building Issues			
(a) Buildings or structures set back from nearest road boundary	> 5 metres		
(b) Building height excluding any parapet	< 7.2 metres		
(c) Landscaping with trees and shrubs on	Min 3 metres in width		

OPERATIONAL CRITERIA FOR TANK CULTURE	TIER 3 LEVEL OF ASSESSMENT		
	LEVEL 1	LEVEL 2	LEVEL 3
each street frontage or surrounding buildings(except in industrial sites where space is a limiting factor)			
(d) Driveways with regards to access, widths and turning circle	Comply with R.T.A. standards		
(e) Truck loading and unloading space on site	Queuing or waiting not required on public roads		
(f) Compliance with Building Code of Australia	Meet the deemed to satisfy provisions		
(g) If unsewered site, on-site human sewerage system	Complies with the approval requirements of the Local Govt. Act		

In summary, if the proposal is subject to more detailed investigations in relation to Aboriginal heritage issues that indicate no items of regional or national significance exist, the proposal could be defined as class 2 under clause 13(2) (i.e. all risk levels in relation to each attribute are level 2 or levels 1 and 2).

It follows pursuant to clause 14(f) of the instrument, that if the proposal can properly be categorized as class 2, then it would not be classified, as designated development and therefore an Environmental Impact Statement would not be required. (Schedule 3 of the Environmental Planning and Assessment Regulations, 2000 provides that development for the purposes of aquaculture is not designated if State Environmental Planning Policy No.62 – Sustainable Aquaculture applies.)

4.4 STATE ENVIRONMENTAL PLANNING POLICY NO. 44 – KOALA HABITAT PROTECTION

In summary, this policy requires a plan of management to be prepared and approved by the Director General of the Department of Infrastructure, Planning and Natural Resources before Council may consent to development within core Koala habitat areas.

4.5 NORTH COAST REGIONAL ENVIRONMENTAL PLAN 1988

This plan provides for a number of matters to be considered when assessing Development Applications. Some matters duplicate similar provisions in other environmental planning instruments, however the key considerations relevant to this site include;

Clause 12 – Impact on Agricultural Activities.

Darryl Anderson Consulting Pty Ltd

A.C.N. 093 157 165

Town Planning & Development Consultants

Clause 29A – Impact on Natural Areas and Water Catchments.

Clause 32B - Coastal Lands including consideration of the NSW Government Coastal Policy, The Coastline Management Manual and the North Coast Design Guidelines.

Clause 33 – Coastal Hazard Areas.

Clause 81 – Development Adjacent to the Ocean or a Waterway.

4.6 TWEED LEP 2000

The subject land is zoned Rural 1(a) and Agricultural Protection 1(b2) under this plan. Development for the purposes of an “animal establishment” (i.e. aquaculture) is permissible, with consent, in these zones.

The pipelines and pump station are proposed to be located on Public Roads and on Crown land zoned 6(a) Recreation.

The land to the east of Marine Parade, Kingscliff is zoned 6(a), being the Kingscliff Beach Crown Reserve. Development for the purposes of an “Animal Establishment” is prohibited in the 6(a) zone and therefore an amendment to the LEP would be required or the Minister could approve the proposal under Section 89 of the Act as “prohibited development”.

There are a number of provisions in the Local Environmental Plan which Council must take into account in considering a Development Application, Again, some provisions duplicate similar provisions in other environmental planning instruments, however the key considerations relevant to this site include;

Clause 15 – Availability of Essential Services.
Clause 17 – Social Impact Assessment.
Clause 18 – Rural Workers Dwellings.
Clause 22 – Development Near Designated Roads.
Clause 23 – Control of Access to Designated Roads.
Clause 24 – Setbacks to Designated Roads.
Clause 34 – Flooding.
Clause 35 – Acid Sulfate Soils.

4.7 NSW COASTAL POLICY 1997

Table 2 of the policy provides a summary of strategic actions relevant to development control. Once again, some strategic actions duplicate issues arising from other instruments and policies, however the key matters are summarised as follows;

1.2.5. – Threatened species conservation Act.
1.3.1. – EPA licensing of sewerage treatment plants and other points source discharges.
1.3.7. – Wastewater discharge limits.
1.4.5. – Assessment of Coastline development proposals.
2.2.2. – Sea level Change.
3.2.4. – Design and location principles for Development Applications.

Darryl Anderson Consulting Pty Ltd

A.C.N. 093 157 165

Town Planning & Development Consultants

4.2.3. – Coastal sites of Aboriginal heritage significance.

4.8 INTEGRATED DEVELOPMENT (OTHER AGENCY APPROVALS)

Section 91 of the Act provides that development requiring consent and approvals under other Acts is “integrated development”. Before granting consent, the consent authority must obtain from each relevant approval body the general terms of any approval proposed to be granted by that body. The general terms are normally included in any consent granted.

Having regard to section 91 of the Environmental Planning and Assessment Act, approvals are or are likely to be required from the following approval bodies;

- ♦ NSW Fisheries – Fisheries Management Act, 1994.
- ♦ Department of Environment and Conservation – National Parks and Wildlife Act, 1974.
- ♦ Department of Environment and Conservation – Protection of the Environment Operations Act, 1997.
- ♦ Department of Infrastructure Planning and Natural Resources – Rivers and Foreshore Improvement Act, 1948.
- ♦ Department of Infrastructure Planning and Natural Resources – Water Act, 1912.

5.0 KEY MERIT ISSUES

A number of merit issues have been identified in section 4.0 of this report. In addition the following key issues need to be considered.

5.1 Flood Impacts

As stated earlier, SEPP No. 62 requires a detailed risk assessment where a site, that is flood affected, has been chosen for an aquaculture project. The Bay Lobster project requires the filling and bunding of the site to provide buffering from the 1:100 flood event. The potential impacts of this action on flood levels, flows and retention will require flood modelling to demonstrate that there are no potential adverse cumulative impacts. Tweed Shire Council is currently finalising a new hydraulic model that extends from upstream of Murwillumbah to the Tweed River entrance. The model will be used to determine design flood behaviour for the Tweed River and its floodplains. The proponents are currently discussing the possibility of utilising this model to determine the potential filling and bunding effects of the development and whether these are within acceptable limits.

5.2 Traffic and Transport

The facility will generate approximately 3 tonnes of product per day which will be transported to the airport via a small rigid commercial vehicle (under 10 tonnes gross vehicle mass).

Food will be transported to the site in containers by articulated vehicles with a gross vehicle mass of approximately 40 tonnes. (300 tonnes of on-site storage will be provided for food and consumption is approximately 7 tonnes per day) It is estimated that an average of 2 – 3 truck deliveries of food per week will be generated, although in practice food deliveries will occur approximately every 3 – 4 weeks rather

than on a regular daily or weekly basis.

5.3 Marine Water Exchange Treatment And Disposal

NSW Fisheries and The Department of Environment & Conservation have confirmed that the current moratorium on ocean outfalls does not apply to aquaculture. However, exchange water quality will be a key issue to be negotiated with the Department of Environment & Conservation prior to the issue of a licence by that authority.

5.4 Cane Fire Hazards

In view of the nature of the tank construction materials and the location of existing/potential cane fields, cane fire risks will result in the need for buffers to adjacent land to ensure that facilities are not exposed to fire risks. A detailed cane fire hazard assessment may be required to address this issue.

5.5 Marine Water Intake And Marine Water Exchange Lines And Facilities

These components of the development would be located on a Crown Reserve (Kingscliff Beach) which will require approvals from the Council and the Department of Infrastructure Planning and Natural Resources as the "owners" of these lands. Reference should also be made to other comments in relation to the zoning of this land and the permissibility of the various facilities.

6.0 OPPORTUNITIES AND CONSTRAINTS

A number of site opportunities and constraints have been identified in the previous sections of this report. The purpose of this section is to synthesize those opportunities and constraints to assist in identifying options and reaching conclusions.

6.1 Opportunities

- Convenient to high quality sea water;
- Within approximately 1 ½ hrs drive from Brisbane Airport;
- Adequate transport network available;
- Relatively large and level site available for purchase.

6.2 Relative Constraints

- Cane fire hazards;
- Aerial spraying hazards;
- Flooding;
- Potable water supply;
- Treatment and disposal of marine water exchange;
- Amenity issues;
- Native Title Issues.

Many of the relative constraints can be addressed at the detailed design stage, following further

investigations of the various issues.

7.0 SUMMARY AND CONCLUSIONS

Adjoining land uses to the north and east include sugar cane production and sand extraction.

The advantages and disadvantages of this site are summarized as follows;

Advantages

- Access to the Motorway is readily available.
- It is possible to site an aquaculture facility in an area with no native vegetation.
- Access to high quality seawater is potentially available.
- Large parts of the site are relatively level, with the mean site level above RL 1.0m AHD.

Disadvantages

- The relatively large distance and potential constraints between the site and the ocean.

Our assessment of the Cudgen site reveals that an aquaculture facility could be a permissible development under State Environmental Planning Policy No. 62 within the land zoned Rural 1(a) and Agriculture Protection 1(b2) subject to obtaining further information relating to the levels of the land. In addition a number of relative constraints restrict the development potential of the site. However, based on the information currently available, we consider that a facility could be designed to comply with State Environmental Planning Policy No. 62 and satisfactorily address the merit issues.

The permissibility of the pipeline within the 6(a) zoned land would also need to be resolved

AUSTRALIAN BAY LOBSTERS PRODUCERS PTY LTD PROJECT PROPOSAL

Minimum Performance Criteria as set out under North Coast Sustainable Aquaculture Strategy (August 2000)

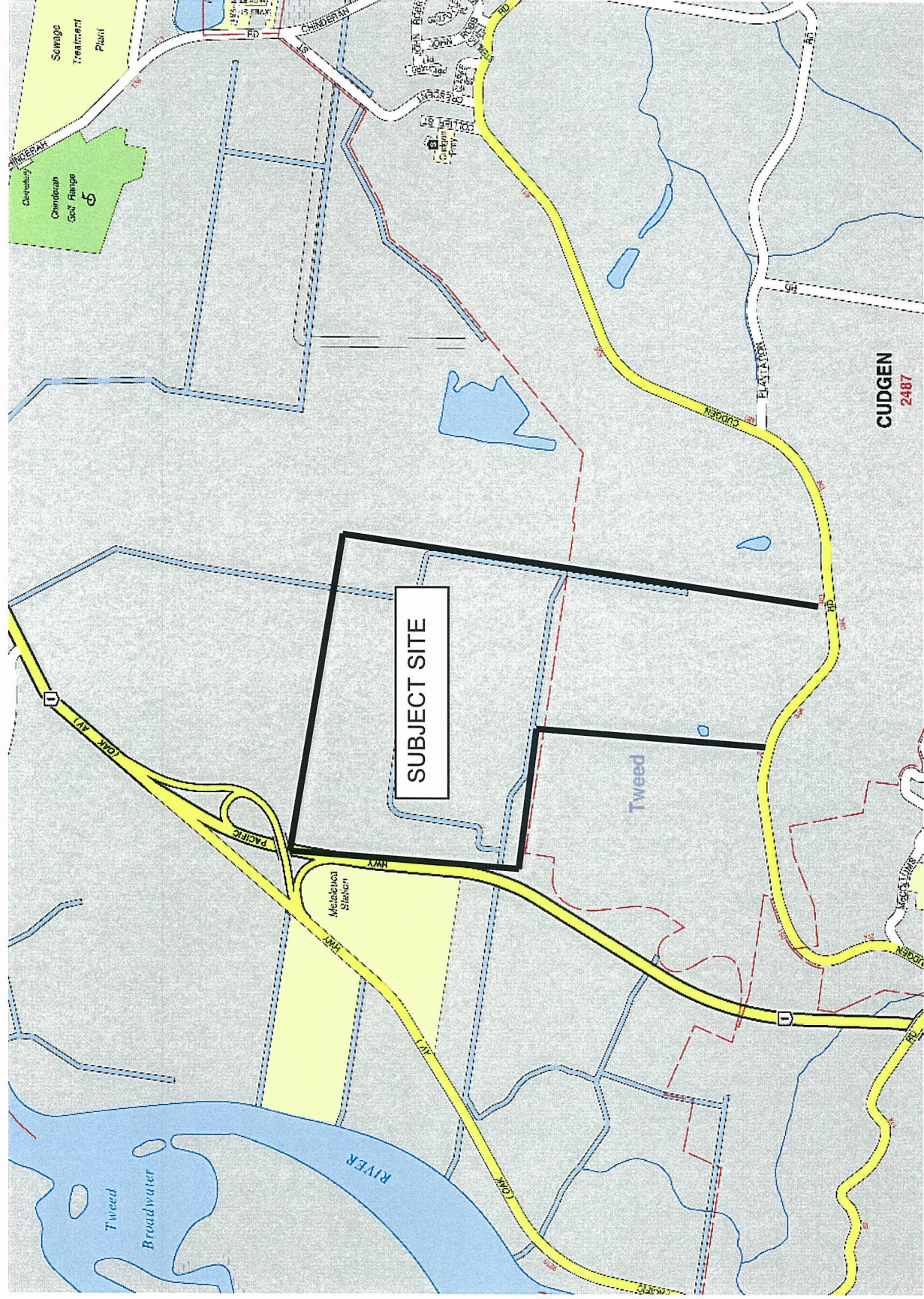
Locational Criteria	Minimum Performance
2(1) LEP zones for ponds	Not Applicable
2(2) LEP zones for tanks	Project is within part Rural 1(a) zone and part 1(b2) Rural Agricultural Protection. Seawater intake is within 6 (a) zone
3. Tidal boundary for estuary ponds	Not applicable – project proposes ocean intake
4. Elevation Australian Height Datum (AHD) for tank based aquaculture (mean elevation above 1m AHD).	Project site will be filled to 2.5m AHD and bunded to 3.7m. Mean natural ground level is 1.02 metres AHD.
5. Landform exclusion zones (high acid sulfate soils risk area)	Project not within ASS risk codes EsO, EcO, EuO, Em in ASS Risk Maps
6. Flood liability	Project land is located below 1 in 100 year flood but intended to fill the site.
7. Conservation exclusion zones	Project is not located in conservation exclusion zone. Proposed intake pipeline access across crown land has 'in principle' support from DIPNR.
Operational Criteria	
8. Species	Project proposes stocking <i>Thenus spp</i> which are consistent with the NSW Fisheries translocation policy
9. Pond design	Not applicable
10. Freshwater culture	Not applicable
11. Outlets from ponds	Project proposes to screen all outlets from water treatment facility (which receives water from tanks) and dispose of to Tweed Shire Council Kingscliff Sewerage Treatment works.
12. Outlet from estuarine farms	Project proposes to hold water in waste water treatment facility for a minimum of 24 hours prior to release to receiving waters.

Darryl Anderson Consulting Pty Ltd

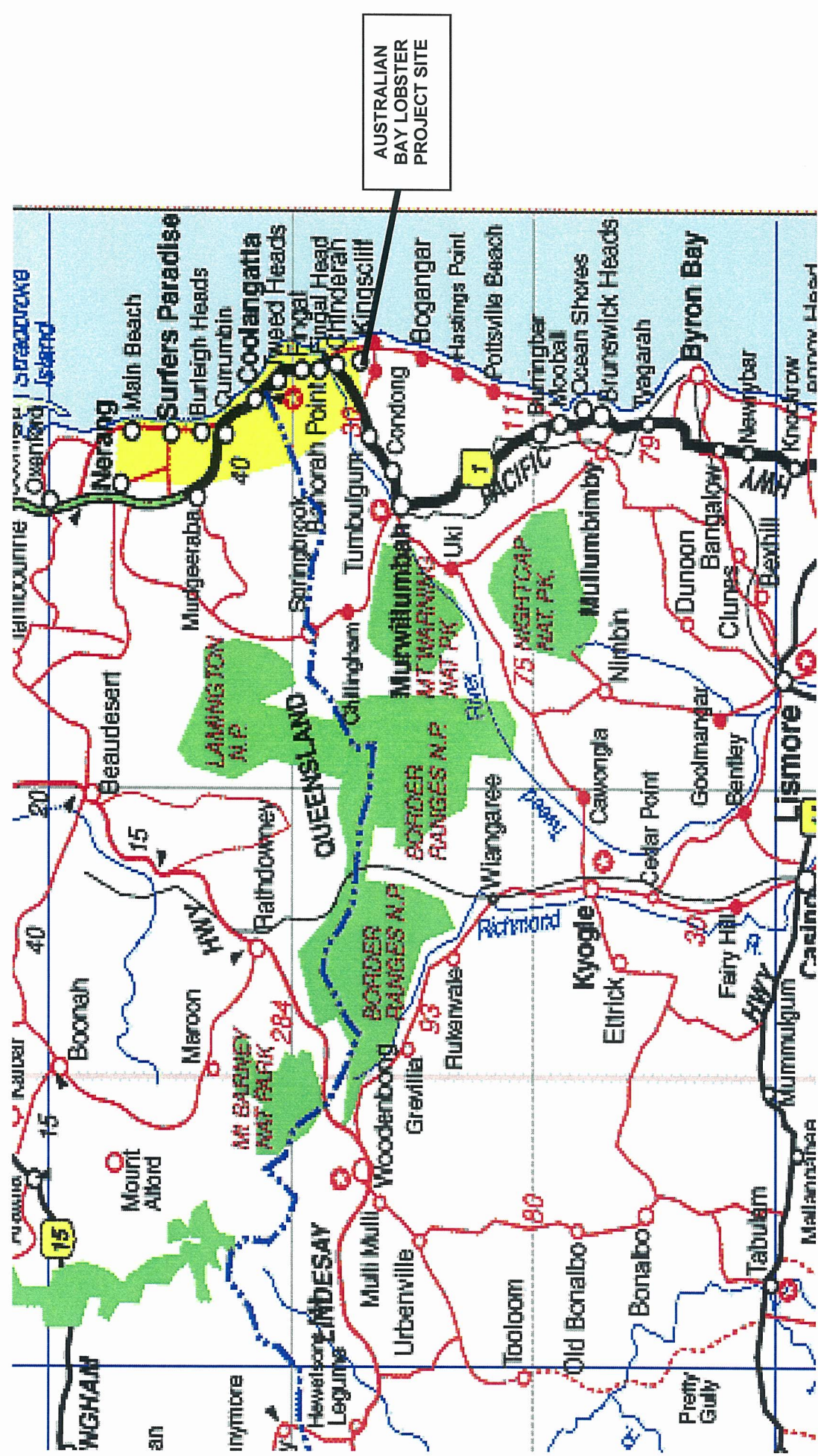
A.C.N. 093 157 165

Town Planning & Development Consultants

AUSTRALIAN BAY LOBSTER PROJECT – SITE MAP



AUSTRALIAN BAY LOBSTER PROJECT – LOCALITY MAP



APPENDIX Q

SEE REQUIREMENTS FROM THE -

- Department of Infrastructure, Planning and Natural Resources
- Department of Environment and Conservation
- Department of Primary Industries
- Department of Lands

Department of
Infrastructure, Planning and Natural Resources

Henry Deane Building
20 Lee Street Sydney NSW 2000
GPO Box 3927 Sydney NSW 2001
T 02 9762 8000
www.dipnr.nsw.gov.au

Major Development Assessment
Telephone: 0297628164
Facsimile: 02 9762 8707
Our Ref: S01/01588
Your Ref:

Mr Michael Dalton
Australian Bay Lobster Producers Pty Ltd
42 Campbell Street
BOWEN HILLS OLD 4006

Dear Mr Dalton

Proposed Australian Bay Lobster Aquaculture Development, 355 Cudgen Road (Lots 706, 708, 709, 710 DP 1000580, Lot 1 DP 267742 and Lot 1 DP 578962), Cudgen - Tweed LGA

I refer to the Planning Focus Meeting held on 19 July 2004 and the subsequent request for the requirements for the preparation of a Statement of Environmental Effects (SEE) for the above proposal.

Specific Requirements

Through discussions at the Planning Focus Meeting for this proposal and subsequent consultation with relevant agencies, a number of key issues have been identified as being of particular relevance for discussion in the SEE. Pursuant to Part 1 of Schedule 1, Clause 2(4) of the *Environmental Planning and Assessment Regulation 2000* (the Regulation), the Director-General requires that the issues summarised below, and provided in detail in the Attachments, be addressed in the SEE. The issues have been ranked to generally indicate those matters the Department considers to be of greatest significance. Ranking is aimed at assisting the preparation of the SEE, and is not necessarily indicative of the actual magnitude of any of the impacts listed.

Issues of Key Environmental Planning Importance for SEE Preparation:

- Water cycle management, including water consumption, recycling and impact of any water release from the site;
- Transport impacts and traffic generation;

Issues of Environmental Planning Importance for SEE Preparation:

- Impacts on flora and fauna, on, in or adjacent to the proposed development should be considered;
- Noise impacts, particularly in relation to sensitive noise receptors;
- Potential hazards and risk implications of the proposed development should be considered, particularly with regards to flooding, sugar cane fires, disease management and predator control;
- Soil management, particularly in relation to any soil contamination, potential or actual Acid Sulfate Soils and any fill requirements;
- Waste management, incorporating the principles of "reduce, reuse, recycle" should be considered;

Other Important Issues:

- Air quality impacts, particularly in relation to odour and particulates;
- Visual impacts should be taken into consideration;
- Aboriginal cultural heritage should be taken into consideration;
- Provisions of relevant environmental planning instruments should be considered;
- Socio-economic impacts on the locality and the broader region should be considered; and
- Effective consultation with the public and Government bodies should be undertaken.

State Significant Development

The Director-General also requires the following for all State Significant Development Applications:

- The Applicant shall nominate a contact person (and telephone number) who will be made available to answer public enquiries about the proposal;
- The Applicant shall consult with the community that is likely to be affected by the proposal. A report on who was consulted must be submitted with the DA, describing how the affected community was identified, consultation methods, and key issues raised by the community;
- The Applicant shall provide a disk containing an electronic copy of the Executive Summary to the SEE, in pdf format or another format that can be easily converted to pdf format (preferably no larger than 1 MB); and
- Electronic copies of the SEE shall be provided on CD in an appropriate format.

Requirements of Integrated Approval Bodies

Under Section 91 of the *Environmental Planning and Assessment Act 1979*, development is "integrated development" if it requires certain approvals from other bodies in addition to the consent authority before it may be carried out.

In your Form A, you indicated that your proposal would require additional approvals from NSW Fisheries (now part of the Department of Primary Industries) under s.144 of the *Fisheries Management Act 1994*, the Department of Environment and Conservation (DEC) under the *Protection of the Environment Operations Act 1997*, the Department of lands and Tweed Shire Council under the *Roads Act 1993* and the Department under the *Rivers and Foreshores Improvement Act 1948* (RFI Act). NSW Fisheries, the Department of lands and the DEC have provided their requirements (see Attachment No.2), and you must address these requirements in your SEE. The DEC's letter also identifies other issues of interest to the DEC such as flora and fauna impacts and Aboriginal cultural heritage and you should consider these during the preparation of your SEE. Issues relating to the permit under the RFI Act have been incorporated into this document.

If further integrated approvals are identified before the Development Application is lodged, you must conduct your own consultation with the relevant agencies and address their requirements in your SEE, and when lodging your Development Application, you must include:

- At least one copy of the Development Application and supporting documentation for each of the integrated approval bodies; and
- Cheques for \$250, made payable to each of the integrated approval bodies.

.Requirements have not been received from Council, and you are advised that you should consult Council directly for its input into your SEE.

Concurrence

You should be aware that under the *Coastal Protection Act 1979* and the *Coastal Protection Regulation 2004* (due to commence 1 September 2004), the concurrence of the Minister for Natural Resources is required to carry out development within the coastal zone that is below the mean high water mark, excluding any estuary.

Commonwealth Approvals

If your proposal contains any actions that may have significant impact on matters of National Environmental Significance, then it may require additional approvals under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). These approvals are in addition to any approvals required under NSW legislation. If you have any questions about the application of the EPBC Act to this proposal, you should contact the Department of the Environment and Heritage in Canberra (6274 1111 or <http://www.deh.gov.au>).

Further Information

Please contact Joanna Bakopanos on (02) 9762 8164 if you require any further information regarding the requirements for the SEE.

Yours sincerely

Scott Jeffries

A/ Manager, Manufacturing and Rural Industries

Major Development Assessment
as delegate for the Director-General

Note: Matters of National Environmental Significance under the EPBC Act are:

- i) World Heritage properties;
- ii) RAMSAR wetlands;
- iii) threatened species or ecological communities listed in the EPBC Act;
- iv) migratory species listed in the EPBC Act;
- v) the environment in a Commonwealth marine area; and
- vi) nuclear actions:

Attachment No. 1

SPECIFIC REQUIREMENTS FOR THE PREPARATION OF A STATEMENT OF ENVIRONMENTAL EFFECTS

Environmental Planning Instruments

- Statutory Planning instruments, the SEE must assess the proposal against the provisions and objectives of all relevant planning instruments, including: *State Environmental Planning Policy No 62 – Sustainable Aquaculture*; *North Coast Regional Environmental Plan*; and the *Tweed Local Environmental Plan 2000*;
- The SEE must also assess the proposal against the provisions and objectives of the *NSW North Coast Sustainable Aquaculture Strategy – Land Based Aquaculture* and the *NSW Coastal Policy 1997*; and
- During preparation of the SEE, you should also consult the Department's Guideline *Extractive Industries – Dredging and other extraction in riparian and coastal areas* which can be purchased from the Department's Information Centre, 20 Lee Street, Sydney (02 9762 8044).

Description of the Development and Environment

- The zoning of the land affected by the proposed development and the permissibility of these works within these zones must be identified. An indication of surrounding land uses and any potential land use constraints should also be provided in the SEE;
- The SEE must clearly outline the general scope of the project, including such details as the nature, number, location and dimensions of the proposed raceways, methods of operation including the production process and schedule, the type of machinery and equipment to be used and water supply and disposal, associated facilities and construction methods and environmental control safeguards;
- The SEE must identify the type(s) of species to be grown, the source of the juvenile organisms/ breeding stock and indicative annual production goals;
- Details on capital investment, hours of operation, employment numbers any staging of the proposal and expected life of the operation should be discussed;
- Details of any new or modified utilities required by the proposed development must be outlined, including the results of any consultations with relevant utility providers in relation to the provision of those utilities; and
- Details on the creation of any necessary easements along pipeline routes.

Water Management

- Full details of the proposal's water cycle and its management should be provided, including measures to reuse water within the process and any proposal to apply water to land or discharge water to natural waterways. The SEE must clearly demonstrate a design process aimed at minimising water discharges from the site;
- Should release of water from the site be required, the SEE should identify all proposed discharge points and provide a clear assessment of the potential volumes and qualities of those waters, including full details of any on-site treatment required before discharge. Consideration should be given to the ANZECC (2000) Guidelines, particularly in relation to recreational water quality and aesthetics (primary contact). In addition, the SEE must provide detailed design specifications, construction methods and post construction landscaping and rehabilitation where any new discharge and outlet points (other than at the STP) must be constructed;

- The SEE must provide details on the volume and method of extraction of saline water from the inlet pipe. The Department notes that no water licence is currently required to extract saline water, however, this will change in the near future;
- Full details of stormwater management systems should be provided in the SEE with a demonstration that those systems can accommodate likely storm events (justification should be provided for the design capacity of those systems). Particular note should be made of any proposed measures to segregate stormwater run-off of varying qualities and proposed stormwater infrastructure (eg major drainage, first flush systems, sedimentation devices etc); and
- Details of the proposed erosion and sedimentation control measures to be utilised throughout the life of the development must be provided.

Transport Impacts

- A Traffic Impact Study (TIS), prepared in accordance with the RTA's publication *Guide to Traffic Generating Developments*, must be included as part of the SEE. The TIS should include details of expected traffic movements to and from the proposed development site with specific consideration of:
 - traffic generation during construction (volume and frequency), site access points, hours of traffic movement and proposed traffic routes;
 - traffic generation during operation (volume and frequency), site access points, hours of traffic movement (particularly in regard to shift times) and proposed traffic routes;
 - the design of the internal roadways and parking;
 - the types of road transport to be employed;
 - the capability of proposed routes (including road and intersection capacity) to handle predicted traffic movements associated with the proposal. Any road upgrades that may be required should be noted with a summary of consultations with the RTA, Council and Department of Lands, where relevant, in relation to those upgrades; and
 - the cumulative impacts of traffic generated by the proposed development.

Flora and Fauna

- The SEE must consider potential impacts of the proposed development on flora and fauna, particularly the need for any clearing of native vegetation and subsequent management. The flora and fauna survey must consider both the site on Cudgen Road and pipeline routes; and
- The SEE must identify potentially impacted critical habitats; threatened species, populations or ecological communities, or their habitats, and apply the test of significance under Part 5A of the *Environmental Planning and Assessment Act 1979*.

Noise Impacts

- The SEE must assess the predicted noise impact resulting from all noise sources during construction and operation, including road traffic noise. The noise assessment must be undertaken in accordance with the DEC's *Industrial Noise Policy (2000)* and *Environmental Criteria for Road Traffic Noise*;
- In relation to construction noise, the noise assessment must be undertaken in accordance with the *Construction Site Noise* guidelines from the DEC's *Environmental Noise Control Manual*. A copy of these guidelines may be obtained from the DEC's Noise Control Policy section on (02) 9995 5785; and
- Consideration of potential impacts resulting from vibration generated during any drilling activities.

Hazard and Risk Management

- Consideration must be given to the potential hazards and risk impacts associated with fires from adjacent sugar cane fields;
- The SEE must take into consideration the flood liability of the site and surrounding land with specific consideration of the 1 in 100 year flood level. The SEE must demonstrate that the proposal will not cause a substantial cumulative impact on flood levels in the area. Details of any proposed flood management systems must be provided. The NSW Government's *Floodplain Management Manual 2001* should be consulted;
- Details of disease management must be provided, with specific consideration of measures to manage disease outbreaks on the farm and contingency plans in the event of mass mortalities. Emergency waste disposal procedures must also be provided; and
- Details on any predation control must be included in the SEE.

Land and Soil Management

- Details of past land uses on the site should be considered, particularly with respect to the potential presence of contaminated soil material on the site and any implications for the proposed future use. Appropriate mitigation, management and/or relevant remediation measures must be outlined for any activity that may affect those areas of the site;
- The SEE must also detail measures to be employed to ensure that operation of the proposed development does not lead to any contamination of the site;
- The SEE must provide details of any soil excavations/ filling on the site, particularly whether any fill needs to be brought on site. The origin, quantities and suitability of the fill needs to be considered; and
- Consideration should be given to the potential disturbance and subsequent management of any Acid Sulfate Soils (ASS) or Potential ASS on site. Reference should be made to the Department's *Acid Sulfate Soils Manual 1998*.

Waste Management

- Construction wastes, including quantities and qualities of waste, their management, minimisation and treatment/disposal methods, should be considered;
- Likely annual rates of production of all waste streams from the proposed development should be provided, including domestic waste products. Proposed methods of treatment and/or disposal of these waste streams should be clearly indicated;
- Wastes that are not to be reused or recycled should be classified in accordance with the DEC's *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes*; and
- Details of waste management at the proposed development should clearly reflect the principles of "reduce, reuse and recycle".

Air Quality

- Air quality impacts, particularly odour and dust. The air quality assessment must identify all fugitive and point source emissions during construction and operation and must assess these parameters from a project-specific perspective in accordance with the Department of Environment and Conservation's (DEC) *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW (2000)* and draft policy *Assessment and Management of Odour from Stationary Sources in NSW (2000)*. The air quality assessment must consider any potential air quality and amenity impacts on any nearby private residences.

Visual Impacts

- The SEE must consider the visibility of the proposed development with reference to the height and scale of the development and materials used, particularly with regards to the potential for any visual amenity impacts on any nearby residential areas, adjacent development and publicly accessible places, including public roads. The SEE must also detail any proposed screening of the development to mitigate or minimise any visual impacts.

Aboriginal Cultural Heritage

- The SEE must consider the impact of the development with respect to the presence of any Aboriginal site or relic, particularly in areas that are proposed to be disturbed. Consideration should also be given to the land affected by proposed pipelines.

Environmental Monitoring and Management

- The SEE must indicate how the environmental performance of the proposal would be monitored and managed during construction and operation. This should include the provision of a comprehensive list of table that details all commitments made by the Applicant in relation to environmental impact mitigation, management and monitoring (such as for water quality, flora and fauna, navigation and visual issues). A clear statement must be made indicating:
 - What measures will be implemented/applied;
 - The scope of these measures; and
 - The timing of implementation/application of these measures.

Consultation

- You should address those issues raised by government agencies at the Planning Focus Meeting held for the proposal on 19 July 2004; and
- Consultation with the parties listed below may be useful in the preparation of the SEE. It is noted that consultation requirements may vary significantly between the parties listed. It is the Applicant's responsibility to justify the extent and scope of all consultations.
 - NSW Fisheries (now part of the Department of Primary Industries);
 - Department of Environment and Conservation;
 - Department of Lands;
 - Tweed Shire Council;
 - NSW Agriculture (now part of the Department of Primary Industries); NSW Coastal Council
 - Roads and Traffic Authority;
 - Relevant utility providers;
 - Local Aboriginal Land Council; and
 - Relevant local community groups.

Your reference
Our Reference : GR2074 * GRF 9287
Contact : Steve Small, 66726134

The General Manager
Department of Infrastructure, Planning &
Natural Resources
Major Developments Assessment
GPO Box 3927
SYDNEY NSW 2001

Coastal Regions

Dear General Manager

PROPOSED AUSTRALIAN BAY LOBSTER AQUACULTURE DEVELOPMENT
355 CUDGEN ROAD, CUDGEN - TWEED LGA.

Thank you for your letter dated 23 July 2004 seeking comments from the Department of Environment and Conservation (DEC) on matters that should be considered in a Statement of Environmental Effects (SEE) for the abovementioned project.

As you may be aware, the proposal will be a scheduled activity under the *Protection of the Environment Operations Act 1997* and therefore require licensing under that Act.

Our general requirements are covered in the Department of Primary Industry's (Department of Fisheries) document entitled *NSW North Coast Sustainable Aquaculture Strategy – Land Based Aquaculture*.

With respect to the *Protection of the Environment Operations Act 1997*, we recommend that the following key issues be addressed in the SEE (All details included in the SEE should be supplied on the basis of stage three infrastructure, raw and treated wastewater volumes):

1. The construction of the intake pipeline may require approvals from Tweed Shire Council and Department of Infrastructure Planning & Natural Resources (for the beach based pumping infrastructure and access).
2. Any proposed wastewater discharge into the Tweed River will require detailed information and modelling to assess the potential impact on aquatic ecosystems and current recreational uses of the river. The assessment needs to take into account the *Water Quality and River Flow Interim Environmental Objectives* for the Tweed River Catchment and the 2002 ANZECC guidelines for fresh and marine waters.
3. If ponds are to be constructed by dredging or if dredging soil is to be used for building foundations an assessment of Potential Acid Sulfate Soils should be undertaken.

Please note that, although the EPA is now a part of the Department of Environment and Conservation, certain statutory functions and powers continue to be exercised in the name of the Environment Protection Authority (EPA).

Department of Environment and Conservation.

PO Box 498 Grafton NSW 2460 Australia

Telephone 61 2 6640 2500

Facsimile 61 2 6642 7743

www.epa.nsw.gov.au

NSW Government Offices 49 Victoria Street Grafton NSW 2460

4. Noise from seawater transfer pumps (especially at night) needs to be addressed in accordance with the NSW *Industrial Noise Policy*.
5. Detailed explanation of how the water cycle systems work – infrastructure, backup, contingency plans, nutrient monitoring etc.
6. Details of reuse, recycling and disposal of water, effluent and solid waste.

The following comments relate to the DEC statutory responsibilities under the *National Parks and Wildlife Act 1974* (NP&W Act), the *Threatened Species Conservation Act 1995* (TSC Act) and the *Environmental Planning and Assessment Act 1997* (EP&A Act).

The relevant issues contained in the general list of environmental issues (attachment 'A') should be addressed in the SEE.

Some issues detailed in the attachment will be of greater relevance to the proposal than others, depending on the natural and cultural heritage values of the area involved.

Flora and Fauna:

- A preliminary review of the DEC Wildlife Atlas indicates that there are no threatened flora or fauna species recorded on the subject property. However, this may be due to a lack of survey. As such, a flora and fauna assessment, including an eight part test under section 5A of the EP&A Act, will need to be carried out.
- The proposed location of the pipeline will need to address flora and fauna issues in areas comprising and/or adjacent to native vegetation, including any proposed works on public land such as reserves.
- If any part of the proposed or future development of the site involves exposed breeding ponds, the SEE will need to address the presence of native bird predators and measures to deal with predator controls. By way of comment, it is unlikely that a permit would be granted to shoot native predators.
- Specific details of any pollutant from discharge of wastewaters, drainage and/or flooding, entering and contaminating the Tweed River system, should be addressed to determine the likely impacts on native aquatic flora and fauna. The SEE should also address the matter of cane drains and the disposal and impacts of saline waste waters.

Aboriginal Cultural Heritage

- A preliminary review of the relevant databases indicates that there are no Aboriginal Cultural Heritage sites recorded on the subject property. However, there are several sites recorded in the locality.
- An archaeological survey should be carried out and an appropriately experienced person, in consultation with the local Aboriginal community should undertake the assessment of the cultural heritage values of the subject property and the proposed route of the pipeline.

Commonwealth Legislation

Your attention is also drawn to the Commonwealth legislation, *Environment Protection and Biodiversity Conservation Act 1999*. The proposal may need to be referred to the Commonwealth Department of Environment and Heritage for approval if the development is likely to constitute a controlled action.

If you have any inquiries please contact Steve Small on 66726134 with respect to air, noise and water quality issues or John Allen for other issues on 66598222.

Yours sincerely

JON KEATS

**Head Regional Operations Unit North Coast
Environment Protection & Regulation Division
Department of Environment and Conservation**

Enclosed: Attachment A

N:\steve\letters2004\Australia fresh1. doc

Attachment A

DEPARTMENT OF ENVIRONMENT AND CONSERVATION ENVIRONMENT PROTECTION AND REGULATION DIVISION - NORTHERN ENVIRONMENTAL ISSUES TO BE ADDRESSED

INTRODUCTION

The following list is provided to assist in the preparation of environmental impact assessment reports. The list details the type of information that is recommended by the Department of Environment and Conservation's (DEC) Environment Protection and Regulation Division (EPRD) - Northern for inclusion in such assessments.

Please note that the provision of information in accordance with this list does not negate the applicant's obligations under any legislative or planning instruments and deals with those components of DEC's responsibilities relating to the *National Parks and Wildlife Act 1974* and the *Threatened Species Conservation Act 1995* only. EPRD suggests that the applicant contact the relevant local council and the Department of Infrastructure Planning and Natural Resources to ascertain these obligations.

GENERAL

1. Map(s) showing the locality of the proposed development in a regional and local context. Local context maps should be based on 1:25 000 topographic plans. Photographs of the site's key attributes may provide useful documentation.
2. A description of the existing environment on the subject land and surrounding land, the proposed development and ancillary works, and the manner in which the environment will be modified by the proposal (particularly with regard to the clearing of native vegetation and impacts on fauna habitat).
3. The area subject to development should be clearly identified on an appropriately scaled plan. This includes all ancillary works such as buildings and other structures, parking areas, loading/processing/treatment areas, access roads, and material stockpiling areas.
4. The applicability or otherwise of Local Environment Plans (LEP), Regional Environment Plans (REP) and State Environmental Planning Policies (SEPP) and Regional Vegetation Management Plans (RVMPs) to the site should be determined and detailed. In particular, your attention is drawn to SEPP No. 14 - Coastal Wetlands, SEPP No. 26 - Littoral Rainforest, SEPP No. 44 - Koala Habitat Protection and the *Native Vegetation Conservation Act 1997*.
5. Your attention is also drawn to the new Commonwealth legislation, the *Environment Protection and Biodiversity Conservation Act 2000*. The Act specifically focuses on matters of national environmental significance (NES matters), which include listed threatened species and ecological communities, World Heritage properties, Ramsar wetlands of international importance, internationally protected migratory species and Commonwealth Marine Areas. If any NES matters under this legislation may be affected by the proposal, approval for the development may also be required from Environment Australia.

FLORA

1. A comprehensive description of the vegetation on the site. This will include an assessment of the condition of the plant communities present, including the designation of conservation significance at a local, regional and State level, and an assessment of the likely occurrence of any threatened species, populations or ecological communities listed under Schedules 1 or 2 of the *Threatened Species Conservation Act 1995* and any Rare or Threatened Australian Plant (ROTAP) species.
2. A plan showing the distribution of any threatened or ROTAP species and the vegetation communities on the site, and the extent of vegetation proposed to be cleared. This plan should be at the same scale as the plan of the area subject to development in order to assist in the assessment the impact of the proposal on the existing vegetation.
3. Where the assessment concludes that threatened species, populations or ecological communities, or their habitats, exist on or in proximity to the subject land, the effect of the proposed development should be determined in accordance with the eight point test described in Section 5A of the *Environmental Planning and Assessment Act 1979*. An assessment of the impact of the development on the plant communities and/or ROTAP species should also be provided.
4. A description of the measures proposed to mitigate and/or ameliorate the impact of the development on the plant communities, threatened and ROTAP species.

FAUNA

1. A fauna survey to identify the distribution and abundance of fauna species known or likely to utilise the site, including a description of available fauna habitats and an assessment of the conservation status of each of the faunal components at a local, regional and State level.
2. A plan showing the results of the above survey. This plan should be at the same scale as the plan of the area subject to development to assist in the assessment of the impact of the proposal on fauna.
3. An assessment of the impact of the development on the identified fauna.
4. An assessment of the existence or likely occurrence of threatened species, populations or ecological communities, or their habitats on the subject land. Where the assessment concludes that threatened species, populations or ecological communities, or their habitats exist on or in proximity to the subject land, the effect of the proposed development should be determined in accordance with the eight point test described in Section 5A of the *Environmental Planning and Assessment Act 1979*.
5. A description of the measures proposed to mitigate and/or ameliorate the impact of the development on fauna.

CULTURAL

1. The presence or absence of Aboriginal objects should be identified and the significance of the area to the local Aboriginal community must be determined. Accordingly, a search of the DEC Aboriginal Heritage Information Management System (AHIMS) should be made and the local Aboriginal community should also be consulted with regard to any Aboriginal heritage issues associated with the proposed development.
2. Aboriginal objects and places of significance to the Aboriginal community are to be detailed on a plan. This plan should be at the same scale as the plan of the area subject to development to assist in the assessment of the impact of the proposal on the identified cultural components.
3. An assessment of the impact of the development on the identified cultural sites.
4. A description of the measures proposed to mitigate and/or ameliorate the impact of the development on the identified cultural sites.
5. A contingency plan that details the measures to be taken in the event that archaeological sites are discovered during the course of operations must be prepared.

DEPARTMENT OF ENVIRONMENT AND CONSERVATION ESTATE

1. Where the proposal may result in impacts on DEC estate or is on land adjacent to DEC estate, an assessment of the impact of the development on DEC estate.
2. A description of the measures proposed to mitigate and/or ameliorate the impact of the development on the DEC estate.

SURVEYS AND ASSESSMENTS

1. Fauna, flora and cultural surveys and assessments should be undertaken by suitably qualified persons and the qualifications and experience of the persons undertaking the work detailed.
2. Dates, site locations, design, methodology, analysis techniques, and weather conditions at the time of the assessments and surveys must be described. The limitations of surveys should be identified and the results interpreted accordingly.
3. Conclusions drawn in surveys and assessments should be substantiated by evidence resulting from those surveys and assessments. The document being supported by the surveys and assessments should reflect these conclusions and clearly state where recommendations of the survey and assessments have been incorporated in the proposal.

DEC DATABASES

1. The DEC can provide records of flora and fauna held in the Wildlife Atlas and / or Rare or Threatened Australian Plants (ROTAP) databases. In addition searches of the DEC AHIMS database can be made. These services generally attract a fee. It should be noted that these databases are not comprehensive, should only be used as a guide and do not negate the need for specific site investigations. Enquires should be made to DEC Hurstville office, telephone (02) 9585 6444.



NSW DEPARTMENT OF
PRIMARY INDUSTRIES

Now incorporating NSW Fisheries
ABN 51 734 124 190-002

Ms Joanna Bakopanos
A / Senior Environmental Planning Officer
Major Development Assessments
Dept Infrastructure Planning & Natural Resources
GPO Box 3927
SYDNEY NSW 2001

Dear Ms Bakopanos

**Re: Proposed Australia Bay Lobster Aquaculture Development, 355 Cudgen Rd
Cudgen –Tweed LGA**

Thank you for your letter of 23 July 2004 requesting NSW Department of Primary Industries (formally NSW Fisheries) detail requirements for the preparation of a Statement of Environmental Effects for the above mentioned proposal.

NSW Fisheries requires the environmental studies examine and demonstrate how impacts on aquatic biodiversity can be addressed to ensure compliance with habitat provisions in the *Fisheries Management Act* 1994 and NSW Fisheries policies that underpin them. This will involve detailing:

- The location and construction techniques used to place the intake and out-take pipes treatment. Information about the likely frequency and extent of maintenance of these facilities and how these actions are to be undertaken;
- The number and type of waterway crossings including agricultural drains traversed by the pipeline route and how they are to be crossed (under boring is generally preferable to trenching);
- Disturbance to potential and acid sulphate soils during construction and operation;
- Discharge volumes and information on the variability of discharge (quality and quantity), including daily peaks and seasonal changes associated with different stages of lobster grow-out;
- Information about the assimilatory capacity of water in the Tweed River to accommodate discharges from the facility. No net impact from the discharge would be required over full range of tidal cycles. It is noted that discharge point C is likely to be constrained by limited flushing at the site and moderate mangrove growth; and
- Contingency measures and protocols for flood events;
- How public safety will be assured at the intake and discharge points and possibilities for maintaining public access particularly for recreational fishers along the foreshore.

Preliminary discussions with estuary general commercial fishers highlight that sites B and C are haul shots for commercial fishing operations.

It is very likely that the proposal will require a permit for dredging and reclamation activities under s. 198 – 203 of the *Fisheries Management Act 1994*. Depending on the final site selected for the discharge point a permit to harm to marine vegetation under s. 204 – 205 of the *Fisheries Management Act 1994*) may also be required. These matters should be specifically clarified in the Statement of Environmental Effects.

Finally, I have also included as an attachment DPI Fisheries' standard minimum information requirements for environmental assessment.

If you have any further enquiries please contact me on (02) 6686 2018.

Yours sincerely



Patrick Dwyer
Conservation Manager (Far North Coast and Border Rivers)

NSW FISHERIES' MINIMUM REQUIREMENTS FOR ENVIRONMENTAL STUDIES

REQUIREMENTS FOR ACTIVITIES THAT COULD IMPACT ON THREATENED SPECIES OR CONTRIBUTE TO KEY THREATENING PROCESSES

- All assessments require a statement about the presence or absence of threatened species. Up to date listings are available on the Fisheries Scientific Committee website: www.fsc.nsw.gov.au
- In determining the presence of threatened species, consideration must be given to the habitat types present within the study area, recent records of threatened species in the locality and the known distributions of these species;
- The condition of the habitat within the area must be discussed noting habitat requirements of threatened species likely to occur and the effect of relevant historical events (including land clearing, agricultural activities, water abstraction/diversion, dredging, de-snagging, reclamation, siltation, commercial and recreational activities);
- Assess potential impacts on threatened species via the 'Eight-Part Test' and upon completion, consultation with NSW Fisheries prior to the EIS being finalised;
- The proponent should note that where significant impact on threatened species is likely, a detailed Species Impact Statement must be prepared to assist in forming a determination.
- The proponent should also note that the *Fisheries Management Act 1994* contains provisions for strict penalties (up to \$220,000 and 2 years imprisonment) to be imposed for individuals or companies that harm an endangered species, population or community or their habitat without proper authority carries.

ASSESSMENT OF LIKELY IMPACTS

- Investigate and report on an area extending downstream and/or upstream as far as is necessary to take all potential impacts into account;
- Discussion possible indirect effects of the proposal on species/habitats in the area surrounding the subject site: for example, through altered hydrological regimes including stormwater runoff and drainage, soil erosion or pollution;
- Outline the habitat requirements of threatened species and species important to commercial or recreational fishing likely to occur in the study area;
- Discuss fish habitats within the study area and the nature and extent of habitat removal or modification which may result from the proposed action;
- Discuss the potential impact of the modification or removal of habitat on fish species in the area;
- For all species likely to have their lifecycle patterns disrupted by the proposal to the extent that individuals will cease to occupy any location within the subject site, the EIS must describe and discuss other locally occurring populations of such species;
- The relative significance of this location for these species in the general locality must be discussed in terms of the extent, security and viability of remaining habitat in the locality;
- Describe the potential contribution of the proposal to cumulative impacts on fish and fish habitat in the vicinity of the proposal.

NSW FISHERIES' MINIMUM REQUIREMENTS FOR ENVIRONMENTAL STUDIES

AMELIORATIVE MEASURES

- Discuss measures for minimising impacts on fish and fish habitat and other environmental safeguards to be employed such as how erosion and run off will be reduced and water quality maintained;
- Specify the nature of any rehabilitation or environmental compensatory works to be undertaken and ongoing maintenance of these works to ensure their benefits are maintained;
- Describe ongoing management actions within the proposal, both during construction and after completion, which relate to impact minimisation eg Environmental Management Plans;
- Detail monitoring programs, including methodologies that assess Before and After, Control and Impact sites to determine the success of techniques used to ameliorate impacts on aquatic biodiversity level of impact of the development;

The EIS must consider how the proposal has been or may be modified and managed to conserve fisheries habitat on the subject site and in the study area.

In discussing alternatives to the proposal, and the measures proposed to mitigate any effects of the proposal, consideration must be given to developing long term management strategies to protect areas within the study area which are of particular importance for fish species. This may include proposals to restore or improve habitat.

Any proposed pre-construction monitoring plans or on-going monitoring of the effectiveness of the mitigation measures must be outlined in detail, including the objectives of the monitoring program, method of monitoring, reporting framework, duration and frequency.

Please Note: Persons undertaking aquatic surveys may be required to hold or obtain appropriate permits or licences under relevant legislation. It is recommended that, prior to any field survey activities taking place, those persons proposing to undertake those activities give consideration to their obligation to obtain appropriate permits or licences which may be required in the specific context of the proposed survey activities.

For example:

Fisheries Management Act 1994

- Permit to take fish or marine vegetation for research or other authorised purposes (Section 37)
- Licence to harm threatened (aquatic) species, and/or damage the habitat of a threatened species (Section 220ZW).

Animal Research Act 1985:

- Animal Research Authority to undertake fauna surveys.

NSW FISHERIES' MINIMUM REQUIREMENTS FOR ENVIRONMENTAL STUDIES

USEFUL DEFINITIONS

The definitions given below are relevant to these requirements:

Fish means any part of marine, estuarine or freshwater fish or other aquatic animal life at any stage of their life history (whether alive or dead). Fish include oysters and other aquatic molluscs, crustaceans, echinoderms and beachworms and other aquatic polychaetes.

Marine vegetation means any species of plant that at any time in its life must inhabit water (other than fresh water).

Waters refers to all waters including tidal waters to the Astronomical High Tide Level (AHTL) as well as flowing streams, irregularly flowing streams, gullies, rivers, lakes, coastal lagoons, wetlands and other forms of natural or man made water bodies on both private and public land.

Dredging work means:

- (a) any work that involves excavating water land, or
- (b) any work that involves the removal of material from water land that is prescribed by the regulations as being dredging work to which this Division applies.

Farm Dam means the backed up waters of any dam, or impoundment, located on land that is not public water land.

Reclamation Work means any work that involves:

- (a) using any material (such as sand, soil, silt, gravel, concrete, oyster shells, tyres, timber or rocks) to fill in or reclaim water land, or
- (b) depositing any such material on water land for the purpose of constructing anything over water land (such as a bridge), or
- (c) draining water from water land for the purpose of its reclamation.

Water Land means land submerged by water:

- a) whether permanently or intermittently, or
 - b) whether forming an artificial or natural body of water,
- and includes wetlands and any other land prescribed by the regulations as water land to which this Division applies.

Wetlands includes marshes, mangroves, swamps, or other areas that form a shallow body of water when inundated intermittently or permanently with fresh, brackish or salt water, and where the inundation determines the type and productivity of the soils and the plant and animal communities.

NSW FISHERIES' MINIMUM REQUIREMENTS FOR ENVIRONMENTAL STUDIES

Further Information

The NSW Fisheries Policy and Guidelines series contains more detailed information on techniques and practices that satisfy NSW Fisheries requirements to minimise impacts of developments on fish and fish habitat. The Guidelines are available at www.fisheries.nsw.gov.au. Considering the information in these documents prior to developing and submitting your proposal is strongly recommended.

Another document "*Guidelines for the Assessment of Aquatic Ecology in EIA*" (Draft 1998) produced by the Department for Urban Affairs and Planning (now planningNSW) may prove useful in outlining appropriate procedures and methodologies for conducting aquatic surveys required for the preparation of an EIS.



Department of Lands

Land Administration & Management
Property & Spatial Information

Joanna Bakopanos
Major Development Assessment
Department of Infrastructure, Planning and Natural Resources
GPO Box 3927
SYDNEY NSW 2001

Locked Bag 10
GRAFTON NSW 2460

Contact: Richard Dunning
Phone: (02) 66402045
Fax: (02) 66402035
e-mail: richard.dunning@lands.nsw.gov.au

Dear Ms Bakopanos

**Re: Agency Requirements for Australian Bay Lobster Producers Proposed
Aquaculture Development**

I refer to your letter dated 23 July 2004 requesting the Department of Lands requirements for the preparation of a Statement of Environmental Effects for the proposed aquaculture development by Australian Bay Lobster Producers. Three potential options for sea water release and one option for sea water intake have been identified for the proposed development, all of which traverse Crown land, details are provided below:

Intake route A

- Crown public road traversing Lot 2 DP 777905 in the Parish of Cudgen and County Rous (indicated by "A" in the attachment),
- Crown Reserve 1001008 for public recreation and coastal environmental protection (notified 31 October 1997). Tweed Shire Council is the appointed Corporate Manager of the Tweed Coast Reserve Trust charged with the care, control and management of the Crown reserve. There is no record of any current claim under the provisions of the Aboriginal Land Rights Act 1983 being lodged over the Crown Reserve, however, native title rights and interest in the land under the Native Title Act 1993 (Commonwealth) are unlikely to have been extinguished over the Crown reserve (indicated by "B" in the attachment).

Outlet route B

- Crown public road on the south west corner of Lot 706 DP 100058 and Crown public road on the bank of the Tweed River, both in the Parish of Cudgen and County Rous (indicated by "C" and "D" in the attachment).

Outlet route C

- Crown public road running north of the Pacific Highway to Boyds Canal in the Parish of Cudgen and County Rous (indicated by "E" in the attachment).

13 AUG 2004
DEVELOPMENT
INFRASTRUCTURE



Outlet route D

- Crown public road north east of Lot 121 DP 755701, Crown public road which forms the northern end of Walsh St, Chinderah, and Crown public road which traverses Lot 2 DP 777905 in the Parish of Cudgen and County Rous (indicated by "F", "G" and "A" in the attachment).

Issues that need to be addressed in the Statement of Environmental Effects in regard to the impact of the proposed development on Crown land include the following:

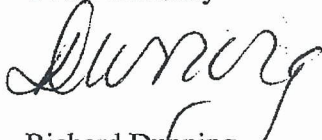
- the consistency of the proposed development with the purpose of the Tweed Coast Reserve,
- whether the proposed development would effect native title on Crown Reserve 1001008 for public recreation,
- the level of public consultation regarding the proposed development,
- the impact of vegetation removal and soil disturbance on river bank, river bed and coastal dune stability,
- the impacts of soil disturbance on acid sulfate soils, and
- impacts of any vegetation removal on threatened species, populations or endangered ecological communities or their habitat.

Australian Bay Lobster Producers PTY Ltd would be required to obtain a licence or easement from the Department to undertake any development or activities on Crown road reserves. Approval from the Department would also be required to undertake activities within Crown Reserve 1001008 for public recreation which are beyond the scope of the Tweed Coast Reserve Plan of Management. Until the final seawater return route has been selected the Department is unable to provide relevant approvals or licences.

In regard to Crown Reserve 1001008 for public recreation and the proposed siting of a pumping facility within the reserve, it may be possible to overcome the issues surrounding the non-extinguishment of native title if the pump facility were contained within a redevelopment of the existing public toilet amenities facility.

If you have any queries please contact me on the number above or contact Kersten Tuckey on 02 6640 2062.

Yours sincerely



Richard Dunning
Acting Manager (Business Services)
Crown Lands NSW
FAR NORTH COAST

APPENDIX R

- Permits
- Consultation

General Fisheries Permit

Permit Number	PRM04459H	Term	04 Feb 2004	Expires	03 Feb 2009
---------------	-----------	------	-------------	---------	-------------

Issued To:

AUSTRALIAN BAY LOBSTER PRODUCERS PTY L TD

37 WATSON STREET
NEWMARKET QLD 4051

AUTHORISED ACTIVITIES

- (1) The holder of this permit or anyone in charge of a boat nominated below is authorised to collect and retain berried female bay lobster (Moreton Bay Bugs, *Thenus spp.*) from Queensland East Coast jurisdictional waters in two areas:
 - Between 23 deg 22 min south latitude and 26 deg 46 min south latitude
 - Between 17 deg 32 min south latitude and 16 deg 05 min south latitude

CONDITIONS

- (1) The following boats licensed for operations in the T1 fishery may be used to collect berried female Moreton Bay bugs

BoatName	Boat Mark
Riflebird	FTTD
Hydra-Cat	FWSR
Craig Glynn Anne	FADX
Robin six	K49
Toopin	FWVL
Bellenden Research	FBN
Tiffany-Ben	FCK
Endura	H3N
Meriki	FRSV
Paulette	FTTW
- (2) The holder must advise either Cairns or Hervey Bay Queensland Boating and Fisheries Patrol prior to each boat being utilized to collect and retain berried female Moreton Bay bugs.
- (3) The person in charge of the T1 boat must: advise the Queensland Boating & Fisheries Patrol:
 - That the boat is about to collect and retain berried female Moreton Bay bugs,
 - How many berried female Moreton Bay bugs are to be taken;
 - The identification details of the boat
 - The current position report of the boat

Continued overleaf

Delegate of the Chief Executive

Queensland Fisheries Service

Permit Number	PRM04459H	Term	04 Feb 2004	Expires	03 Feb 2009
---------------	-----------	------	-------------	---------	-------------

Continued

- (4) The person in charge of a boat operating under (3) must be in port within 4 days of the notification under (3) and advise the Queensland Boating & Fisheries Patrol of:
The port at which the berried female Moreton Bay bugs are to be landed
How many berried female Moreton Bay bugs will be landed
 - (5) A maximum of 200 berried female Moreton Bay bugs may be held on a boat operating under this permit.
 - (6) A maximum of 1100 berried female Moreton Bay bugs may be taken under this permit per year
 - (7) The person in charge of a boat operating under this permit must carry a copy of this permit during all authorised activities and produce it at any time on request for inspection by an officer authorised under the Fisheries Act 1994.
 - (8) The approved species may only be taken ALIVE as broodstock and transported to hatcheries.
 - (9) Broodstock collected under this Permit must be used for aquaculture purposes.
 - (10) This permit does not authorise the collection of berried female Moreton Bay Bugs in closed seasons/ areas under the Fisheries Regulation 1995 or the Fisheries (East Coast Trawl) Management Plan 1999.
-

Graham Foxwell

39 Sunshine Avenue

PO Box 6816

Tweed Heads South NSW 2486

Phone: 0755240512 Facsimile: 07 55240550

Mobile: 0419440512

Our Ref:

Your Ref:

31 August 2004

David McPhee & Associates
220 Priors Pocket Road
Mogill Qld 4070

Attention: David McPhee

Dear Sir ,

RE: Proposed Aquaculture Project - Cudgen

Thank you for your letter dated 26/7/2004 regarding electrical supply to the above proposal.

An 11kV line runs parallel to your boundary on the northern side of lot 1. The poles 130088 to 130095 support this line and it is proposed that your 11kV underground service will originate from one of these poles. Your customers terminals will be at the incoming terminals of the breaker at this metering point.

Details of your proposed metering point will need to be submitted to Country Energy's planning department for approval. All work is to comply with NSW service rules, and SAA requirements. Particular attention must be paid to NSW service rules section 7, high voltage installations and SAA section 7.8, also relating to HV installations.

The existing overhead line will be sufficient for Stage 1 but may require upgrading for stage 2 of your development. You may be responsible for some of this cost. This would be determined at the time of request.

An estimate of cost to install the high voltage service, pole alteration and terminations at pole and metering unit are in the Vicinity of \$13,000 (allowing app 20m run) inclusive of GST and IPART fees.

Yours faithfully

Graham Foxwell

Project Manager Tweed

AUSTRALIAN BAY LOBSTER PRODUCERS BAY LOBSTER PROJECT, CHINDERAH

COMMUNITY CONSULTATION

**KINGSCLIFF PROGRESS ASSOCIATION
7.30pm MONDAY 4 OCTOBER 2004
KINGSCLIFF PRIMARY SCHOOL**

Attendance: Approx. 55

Proceedings: Introduction by President Pete Gladwin

Brief introduction to project & project principals by Trevor Wilson, Department of State & Regional Development

Project overview – 'PowerPoint' presentation by David Hewitt, Marine Biologist, ABLP

QUESTIONS

(from members of the audience, answered by Michael Dalton, Managing Director ABLP and David Hewitt of ABLP)

Q. When is the project scheduled to commence operation if it receives approval?

A. If we received approval by Feb 2005, then product should start flowing by Dec 2005.

Q. Where are the seawater intake pumps to be located?

A. The pump station will be located in the Reserve opposite the Kingscliff Police Station and the seawater intake will be 4 metres below the beach, within the sand profile at the extent of the low water mark.

Q. Will it be possible to conserve energy through pipeline design and will any product be available for the local market?

A. There's a very limited opportunity to conserve pump energy as the pipeline route is fairly flat, however as there is little difference in height between the intake and the site, this will assist in conserving energy. About 10% of product is planned to be sold locally.

Q. The facility is to be located in the floodplain, how will you protect it from floods?

A. The site will be protected from the 1 in 100 year flood by a mixture of filling and bunding. The site will be filled by about 1 metre, with a 1.7 metre bund wall on top of that...the effects have been modelled using the same consultant's who have produced Tweed Shire Council's new floodplain model, which indicates very small localised impacts.

Q. How much squid and other product will be used as feedstock and will this increase demand for more of this product?

A. The facility will use a mixture of squid for grow-out product and mussel for soft-shell product...about 7 tonne a day. This is not table quality squid, it's known as commercial by-catch. ABLP is actively undertaking R&D to replace the squid & mussel feedstock with a composite processed product...challenge is to develop a suitable food binder, we are making good progress in this area.

Q. Will the facility be open to the public or for tourism purposes?

A. No, principally it's a commercial operation with quarantine quality controls in place, however if there is an overwhelming demand we could look at a demonstration model down the track, but successful commercial production is our first priority.

Q. What impact is the seawater intake likely to have?

A. The pumphouse will occupy a small area of around 25 square metres and will be almost completely underground, with landscaping to soften any impact. No excavation will be required for the pipeline; it will be directionally drilled from the pumphouse to the beach through 'coffee' rock found below the beach and backdune area. The seawater intake heads will be in the sand profile about 4 metres below beach surface at the low tide level.

Q. How much seawater will be used by the operation?

A. The project uses recirculation technology, so we only need to top up operation by about 5% of its total capacity each day...this represents about 600 kilolitres of seawater a day.

Q. How do you control the water quality on the discharge side of the facility?

A. All of the facility's water storages are under cover, including the rainwater storage, this prevents aerial contamination from birds, ash from canefires etc. The production facilities are also enclosed within temperature controlled horticultural type structures. The system has been designed as separate components, so if something goes wrong in one area; it can be isolated and shut down. Also because we use recirculation technology, the entire plant can be shut down for several days if the need arises. All return seawater is treated with ozone as a precautionary measure.

Q. What about odour from this operation?

A. The nearest residence is over 1.5 kilometres from the facility and it's not like a sewerage treatment works where you are treating human waste. There is very little odour associated with this facility as the breeding raceways are contained within temp controlled horticultural type structures, which staff will be working in. A small amount of organic waste will go to landfill.

AUSTRALIAN BAY LOBSTER PRODUCERS BAY LOBSTER PROJECT, CHINDERAH

COMMUNITY CONSULTATION

**CHINDERAH PROGRESS ASSOCIATION
(CUDGEN PROGRESS ASSOCIATION MEMBERS INVITED
AND CUDGEN ROAD RESIDENTS GIVEN LETTERBOX INVITATION)**

**7.45pm TUESDAY 5 OCTOBER 2004
CUDGEN HEADLAND LEAGUES CLUB**

Attendance: Approx. 21

Proceedings: Introduction by President Felicia Cecil

Brief introduction to project & project principals by Trevor Wilson, Department of State & Regional Development

Project overview – ‘PowerPoint’ presentation by David Hewitt, Marine Biologist, ABLP

QUESTIONS

(from members of the audience, answered by Michael Dalton, Managing Director ABLP and David Hewitt of ABLP)

Q. How do you distinguish between the quality of discharge from the ABLP facility and Tweed Shire Councils Sewerage Treatment Works if you are using a common discharge point?

A. In our discussions with TSC and the Dept of Environment and Conservation we have proposed a simultaneous sampling and monitoring regime at our respective plants, so if there's a question of quality control it can be traced to source. Accountability and traceability is built in to the quality control.

Q. What type of Landscaping do you propose for the site and what are you planning for the rest of the property...any golf courses?

A. There is an existing stand of mature Casuarinas along the western boundary of the site between the proposed structures and the Motorway and we intend planting other local species around the perimeter and the bund walls. ABLP plan to use about 45 hectares of the property for the 3stages of the project. The remainder of the property will retain the existing uses of grazing beef and possibly growing sugar cane. The sugar cane quota for the property will be retained. No golf course is planned....ABLP is an agribusiness company, not property developers.

Q. Are any Tourism uses proposed for the site?

A. No, as outlined previously ABLP is an agribusiness operation, but down the track if there is strong demand, a demonstration model could be considered.

Q. When is the proposal likely to go on public exhibition and where will it be exhibited? Could it be exhibited locally?

A. Hopefully it will commence exhibition at the end of this month, depending on how quickly we can finalise the supporting documentation. It's likely to go on exhibition at Tweed and Murwillumbah Civic Centres, but could possibly go into the Kingscliff Library as well.

Q. What are the effects of the project on the Chinderah floodplain and what assessment has been carried out on this aspect of the project?

A. Because of the history of development pressures in the West Kingscliff and Chinderah Village areas regarding possible filling, Tweed Shire Council required ABLP to not only model the 1 in 100 year flood effects of the ABLP proposal, but several other scenarios as well. ABLP used the professional services of the same consultants who have compiled the Councils new floodplain model. The first scenario includes the effects of filling for the ABLP proposal, by itself. The second scenario includes, the effects of filling 4 additional sites (Chinderah Village, new Sewerage Treatment Works, West Kingscliff and land upstream of Oxley Cove on northern side of the Tweed River), in conjunction with the ABLP site. The third scenario is a rerun of the second scenario without the inclusion of ABLP. Overall the modelling shows the ABLP proposal has no added cumulative impact when included with the filling of the other 4 sites. When considered by itself the ABLP has only minor localised positive and negative floodplain impacts. (the answers included extensive reference to different PowerPoint slides which detailed the 3 floodplain impact scenarios referred to)

Q. What sort of waste-stream does the project produce?

A. There are basically two waste-streams – the seawater return and a solid organic waste. ABLP propose to use the existing TSC sewerage treatment outfall facility, which will be monitored separately to meet stringent discharge standards. Part of the organic waste-stream, the shells, contain a product called Chiton, used in products like weight loss pills, which is a saleable product. A small amount of organic waste will go to landfill.

Q. How do you treat infections if they occur?

A. The system has been designed as a series of individual components which can be isolated, shut down and disinfected if problems occur. These situations are rare, however ABLP has incorporated world best practice in its process design which caters for this probability.

Q. What route does the pipeline follow?

A. Essentially the intake line follows a series of public and crown road reserves from the site to Chinderah Road, through the existing Kingscliff Sewerage Treatment works, along Beach Street out to Marine Parade, then across the Crown Reserve to the pump station opposite the Kingscliff Police station. The return line will run in the same trench until it joins the existing outfall line.

Q. You mentioned jobs in your presentation – what sort of jobs?

A. There will be a range of opportunities offered. There will be 70 jobs at start-up through to over 200 when the third stage is completed. The jobs will range from processing, animal husbandry involving formal training, and work for graduates and post graduates. ABLP hopes to establish formal links with the local TAFE and Southern Cross University to meet these needs. ABLP also has an R&D facility on Bribie Island which will be relocated and incorporated into this project. Why, are you interested in this type of work ? (2 audience members indicated they were graduates with appropriate qualifications who were interested in future employment at the facility).

Q. You have outlined a number of potential impacts of the proposal, overall though, how do you think it stacks up....do the positives outweigh the negatives?

A. As I indicated ABLP has incorporated world best practice in its design....you would be hard pressed to find a superior design anywhere in the world, so we have systematically attempted to minimise any negative environmental impacts. The big positive is the pressure this facility will take off the diminishing wild catch of this species. This facility will produce 1000 tonne per year in stage one, that's about twice the total Queensland wild catch, which varies between 450 and 750 tonne per year.

Example of Consultation Correspondence



September 2004

Dear

Re: Australian Bay Lobster Producers Pty Ltd Proposed Development

Australian Bay Lobster Producers Pty Ltd (ABLP) is proposing to develop an aquaculture facility for the production of the Bay Lobster (*Thenus spp.*) known locally as Moreton Bay Bugs. The company was formed to provide the necessary infrastructure to produce approximately 1,000 tonnes of Bay Lobster product per year in stage 1. The facility will be based on recirculation aquaculture technology within a controlled environment with dedicated wastewater remediation based on biological/mechanical treatment.

Bay Lobsters are widely recognised as a highly desirable product and in this proposed facility will be grown to assured clean and organic quality in an economically and environmentally sustainable way. The project offers continuity of supply of this exclusive product for the first time.

ABLP proposes a significant investment into growing these species utilising technology developed over the past eleven years by the Australian Fresh Group of companies, an international patent protects the relevant intellectual property.

Several benefits would accrue to the Tweed Shire following the establishment of this project including a substantial annual export income, direct employment of more than 70 new jobs would be created in Stage 1, growing to 200+ jobs after stages two and three. Staff training will be undertaken at various levels within the facilities that will include, but will not be limited to, formal training for process and production staff through to technicians at certificate levels and also include postgraduate research. The project will help the development and growth of ancillary industries and further rural employment. There is also the potential for a hatchery development to support industry, stock enhancement and ongoing Research & Development.

The development of this Bay Lobster aquaculture project is dependant on a source of high quality seawater, necessary for the rearing of the delicate lobster larva. ABLP has been working with the New South Wales Department of State and Regional Development and the Tweed Shire Council for several years to identify a suitable site which fulfilled the necessary criteria for the production of Bay Lobster. A neighbouring site on Cudgen Road, namely number 355, Wayne and Shelley Evans' property, has been identified as suitable for the development with the closest source of high quality seawater being the Kingscliff beach. A sub sand intake has been

AUSTRALIAN FRESH CORPORATION PTY LTD
ABN 32074872605
42 CAMPBELL STREET, BOWEN HILLS, BRISBANE 4006
TEL: +617 3252 3772 FAX: +617 3252 5772

proposed for the collection of seawater as it would have the smallest environmental disturbance for installation and operation.

ABLP having completed the necessary studies and work required including surveying, flood impact assessment, geotechnical, noise, visual impact, traffic, seawater intake and return, heritage and flora and fauna, has prepared a Development Application, including a Statement of Environmental Effects, that it intends to lodge in the near future with the approving authority, which in this case is the Minister of Infrastructure, Planning and Natural Resources.

There are three stages of development proposed over the next six years each of which will accommodate approximately 15 hectares. The project proposed will be sited to the north of the property adjacent to the Pacific Highway with access being via the Pacific Highway interchange with Tweed Valley Way at Chinderah. As indicated the proposed project is to be housed within controlled atmosphere conditions and will look similar to a large nursery, all growing structures being plastic covered with shade cloth over the top.

Having a substantial standing stock of in excess of 400 tonne of live animals in each stage it is proposed to protect the facilities against a 1 in 100 year flood event through a combination of fill and a bund wall to 3.7m AHD. WBM Oceanics Australia, the firm employed by the Tweed Shire Council to model the entire Tweed River flood plain, have undertaken a flood impact study that included the potential effects of the Bay Lobster project both on its own on the plain and together with the cumulative effects if all other proposed developments on the plain, as supplied by Council, were to be filled to the same level. The results of the study show that the project would cause very little effect outside the property itself on its own or cumulative with other developments.

All other studies undertaken do not predict any adverse effects to your property. From a visual amenity standpoint ABLP proposes to landscape the development to the benefit of your property and the project itself.

If you require any further detail and/or have any questions regarding the project I am available to attend a meeting if you feel this would assist your appreciation of the project. Please feel free to contact me if you would like to discuss any detail of the project.

Yours sincerely,

Michael Dalton
Managing Director
Australian Bay Lobster Producers Pty Ltd



Please Quote
Council Ref:

Your Ref No:

For Enquiries
Please Contact: Mr Mike Rayner

Telephone Direct (02) 6670 2470

l11jj6.doc

12 October 2004

Mr Michael Dalton
Managing Director
Australian Fresh Corporation Pty Ltd
42 Campbell Street
BOWEN HILLS 4006

Dear Mr Dalton

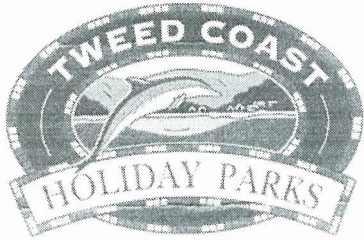
Australian Bay Lobster Producers Pty Ltd

I refer to your letter dated 9 September 2004.

I hereby grant approval for Australian Bay Lobster Producers Pty Ltd to lodge a development application in respect to the use of any public easements, land or public roads under the ownership or care of Council.

Yours faithfully

MR DON BUCKLEY
Acting General Manager



TWEED COAST HOLIDAY PARKS
A COMMUNITY ENTERPRISE

P.O. Box 1013
Tweed Heads
New South Wales 2485
5 Dry Dock Road
Tweed Heads South
New South Wales 2486

Telephone: (07) 5523 4111
Facsimile: (07) 5523 4121
Email: tweedparks@bigpond.com
ABN 16 910 744 225

Please Quote Ref: DW1091717
Your Ref:

L13F01

13 September 2004

The Managing Director
Australian Fresh Corporation Pty Ltd
42 Campbell Street
BOWEN HILLS QLD 4006

Attention: Mr Michael Dalton

Dear Sir

Australian Bay Lobster Producers Pty Ltd - Seawater Pumping Facilities within the Kingscliff Beach Reserve

I refer to your letter dated 3 August 2004. Please be advised that the Trust at its meeting of 8 September 2004 resolved as follows:-

"That the Trust grants approval for Australian Bay Lobster Producers Pty Ltd to lodge a development application for their proposed development."

If you need any further information please do not hesitate to contact me.

Yours faithfully


R J Adams
Executive Manager

MINUTES OF THE DEVELOPMENT ASSESSMENT PANEL HELD WEDNESDAY 1 SEPTEMBER 2004

3. APPOINTMENT:

Addressed By: Mike Dalton and David Hewitt

Postal Address: 42 Campbell Street, Bowen Hills QLD 4006

Present: Messrs Garry Smith, Manager Development Assessment; Danny Rose, Planning & Infrastructure Engineer; Rick Paterson, Manager Building Services and Christine Ross (recorder)

Property

Description: Lots 706, 708, 709, 710 DP 1000580, Lot 1 DP 267742 and Lot 1 DP 578962 No.355 Cudgen Road Cudgen

Land No: 42064,42055,42056,42057,40340 and 18983 DA1460/192 and DA1460/180

Proposal: Proposed Australian Bay Lobster Aquaculture Development

Comments:

- The panel noted that the proposed development is covered by State Environmental Planning Policy No. 62 - Sustainable Aquaculture and as such the State Minister for Infrastructure Planning and Natural Resources will be the consent Authority.
- The proposal is defined as an "animal establishment" under Tweed LEP 2000 and as such the use is permissible with consent.
- The panel noted that a Planning Focus Meeting organized by DIPNR was held on 19 July, 2004 in relation to this proposal and all relevant issues to Council were identified at that meeting. The report by Darryl Anderson Consulting Pty Ltd tabled at the meeting also identified the relevant legislative requirements.
- The panel also noted that on 19 August, 2004 DIPNR has issued their requirements for the preparation of a Statement of Environmental Effect that also identifies all of the key issues of concern to Council.

Conclusion: Given the previous consultation refer to above the proponent should now finalize their application for lodgement with DIPNR.

NOTE:	THESE ARE DRAFT MINUTES ONLY AND ARE SUBJECT TO CONFIRMATION. IF ANY SUBSTANTIAL CHANGES ARE MADE COPIES OF THE ADOPTED MINUTES WILL BE FORWARDED WITH CHANGES HIGHLIGHTED IN ITALICS
--------------	--